SRWRS
Sacramento River Water Reliability Study

Initial Alternatives Report

Final Version, March 2005

SRWRS Partners

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

400/670	minimum of 400,000 AF and maximum of 670,000 AF of flood control storage space in Folsom Reservoir
°F	degrees Fahrenheit
µg/L	microgram per liter
ABFSHIP	American Basin Fish Screen and Habitat Improvement Project
AF	acre-feet
AFB	Air Force Base
AFRP	Anadromous Fish Restoration Program
AFSP	Anadromous Fish Screen Program
ARBCA	American River Basin Cooperating Agencies
ARBCUP	American River Basin Conjunctive Use Program
AROG	American River Operation Work Group
ARPS	American River Pump Station
ARWRI	American River Water Resources Investigation
ASIP	Action Specific Implementation Plan
BA	Biological Assessment
BMP	best management practice
BO	Biological Opinion
CALFED	CALFED Bay-Delta Program
CBDA	California Bay-Delta Authority
CDFG	California Department of Fish and Game
CEPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
cfs	cubic feet per second
COA	Coordinated Operations Agreement
Comprehensive Study	Sacramento-San Joaquin River Basins Comprehensive Study
CSCGF	Central Sacramento County Groundwater Forum
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA 404 Permit	Section 404 of the Clean Water Act Permit
Delta	Sacramento-San Joaquin Delta
DHS	Department of Health Services
DWR	California Department of Water Resources
D-xxxx	SWRCB Decision-xxxx
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
EWA	Environmental Water Account
Fairbairn WTP	E. A. Fairbairn Water Treatment Plant
FMS	flow management standard

Folsom	City of Folsom
HCP	Habitat Conservation Plan
IGSM	Integrated Ground Water and Surface Water Model
Interim Agreement	Contract Between the United States of America and the Sacramento Area Flood Control Agency Concerning the Operation of Folsom Dam and Reservoir
JPA	joint powers authority
JPOD	Joint Point of Diversion
Lincoln	City of Lincoln
LOD	level of development
M&I	municipal and industrial
max-day demand	maximum-day demand
MCL	maximum contaminant level
MFP	Middle Fork Project
mgd	million gallons per day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOU Area	Roseville/Placer County Memorandum of Understanding Area
msl	mean sea level
NAPA Proposition	Draft Proposition Concerning CVP/SWP Integrated Operation
NBHCP	Natomas Basin Habitat Conservation Plan
NCC	Natomas Cross Canal
NCCP	Natural Communities Conservation Plan
NEPA	National Environmental Policy Act
NMWC	Natomas Mutual Water Company
NOAA Fisheries	National Marine Fisheries Service of National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
OCAP	Operations Criteria and Plan
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
Parkway	American River Parkway
PCWA	Placer County Water Agency
PEIS	Programmatic Environmental Impact Statement
PG&E	Pacific Gas and Electric Company
PL	Public Law
POU	Place of Use
PR	Planning Report
Program EIR	Program Environmental Impact Report on Flood Control Improvements Along the Mainstem of the American River
PSA	Purveyor-Specific Agreement in the WFA
Reclamation	Bureau of Reclamation
RM	river mile
ROD	Record of Decision

Roseville	City of Roseville
RWA	Regional Water Authority
RWMP	Regional Water Master Plan (developed by ARBCA)
SacLAFCo	Sacramento County Local Agency Formation Commission
SACOG	Sacramento Area Council of Governments
Sacramento	City of Sacramento
SAFCA	Sacramento Area Flood Control Agency
SDIP	South Delta Improvement Program
SGA	Sacramento Groundwater Authority
Short-Term Settlement Agreement	Short-Term Agreement to Guide Implementation of Short-Term Water management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assist in Meeting the requirements f the 1995 Water Quality Control Plan and to resolve Phase 8 Issues
SIR	Supplemental Information Report
SCWA	Sacramento County Water Agency
SJWD	San Juan Water District
SMUD	Sacramento Municipal Utility District
SMWA	Sacramento Metropolitan Water Agency, now Regional Water Authority
SOI	sphere of influence
SRA	State Recreation Area
SRWRS	Sacramento River Water Reliability Study
SSHCP	South Sacramento Habitat Conservation Plan
SSWD	Sacramento Suburban Water District
SVWMP	Sacramento Valley Water Management Program
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TCD	temperature control device
TCE	trichloroethylene
Upstream Water Users	more than 40 water suppliers in the Sacramento Valley who signed a December 2002 Short-Term Settlement Agreement
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound
Water Forum	Sacramento Area Water Forum
Water Forum year types	American River basin water year types defined in the WFA
WEP	Water Efficiency Plan
WFA	Water Forum Agreement
WFP	Water Forum Proposal
WQCP	1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
WRDA	Water Resources Development Act
WTP	water treatment plant
YCWA	Yuba County Water Agency

CHAPTER 1. INTRODUCTION

In 2002, the Bureau of Reclamation (Reclamation) and Placer County Water Agency (PCWA), on behalf of cost-sharing partners[1] (Sacramento Suburban Water District (SSWD), City of Roseville (Roseville), and City of Sacramento (Sacramento)), initiated the Sacramento River Water Reliability Study (SRWRS). The goal of the SRWRS is to develop a water supply plan that is consistent with the Water Forum Agreement[2] (WFA) objectives of pursuing a Sacramento River diversion to meet water supply needs of the Placer-Sacramento region, and promoting ecosystem preservation along the lower American River.

To fully disclose the process and progress of study development, several interim documents would be prepared under the SRWRS to disseminate preliminary findings to the public. An **Interim Report,** completed in June 2003, outlines identified resource problems and opportunities; goals, objectives, criteria, and constraints for study development; and a series of preliminary alternatives for scoping purposes. This **Initial Alternatives Report** documents refinements of the preliminary findings; the study process; results of initial analyses and screening of preliminary alternatives for further study; and next steps in the SRWRS. It is anticipated that the Initial Alternatives Report will provide the basis for a feasibility report, which includes a **Planning Report** (PR) with an **Environmental Impact Statement** (EIS)/**Environmental Impact Report** (EIR), for Federal and local decision-making.

STUDY AUTHORIZATION

The SRWRS is authorized under Public Law (PL) 106-554, Appendix D, Division B, Section 103 (see next page), which directs the Secretary of the Interior to conduct a feasibility study for a Sacramento River diversion project consistent with the WFA, dated April 24, 2000.

As directed in the authorizing legislation, the SRWRS is to consider a Sacramento River diversion to accommodate the following water supply requests:

- PCWA – 35,000 acre-feet (AF) per year of its Central Valley Project (CVP) contract water for municipal and industrial (M&I) uses.

- SSWD – 29,000 AF per year from its PCWA water sale agreement[3] for use in a groundwater stabilization project.

---

[1] The Reclamation Manual, Directives and Standards CMP 05-02, requires non-Federal cost-sharing for the SRWRS. On June 26, 2002, PCWA signed a Memorandum of Agreement (MOA) with Reclamation to share a minimum of 50 percent of the study cost. PCWA then entered into separate cost-sharing agreements with its third-party cost-sharing partners: SSWD, Roseville, and Sacramento.

[2] The Sacramento Area Water Forum, created in 1993, comprises business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments in the Sacramento region who joined together to meet two co-equal objectives to (1) provide a reliable and safe water supply for the region's economic health and planned development to 2030, and (2) preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. In 2000, Water Forum members approved the WFA, which consists of seven integrated elements necessary to provide a regional solution to water shortages, environmental damage, groundwater contamination, and limited economic prosperity. More details are given in **Chapter 2**.

[3] This water sale agreement was originally with the former Northridge Water District. In 2002, Northridge Water District and Arcade Water District consolidated to form SSWD.

Study Authorization, Public Law 106-554 Appendix D Division B

SEC. 103. (a) IN GENERAL.—The Secretary of the Interior shall conduct a feasibility study for a Sacramento River, California, diversion project that is consistent with the Water Forum Agreement among the members of the Sacramento, California, Water Forum dated April 24, 2000, and that considers—

(1) consolidation of several of the Natomas Central Mutual Water Company's diversions;
(2) upgrading fish screens at the consolidated diversion;
(3) the diversion of 35,000 acre-feet of water by the Placer County Water Agency;
(4) the diversion of 29,000 acre-feet of water for delivery to the Northridge Water District;
(5) the potential to accommodate other diversions of water from the Sacramento River, subject to additional negotiations and agreement among Water Forum signatories and potentially affected parties upstream on the Sacramento River; and
(6) an inter-tie between the diversions referred to in paragraphs (3), (4), and (5) with the Northridge Water District's pipeline that delivers water from the American River.

(b) REQUIRED COMPONENTS.—The feasibility study shall include—
(1) the development of a range of reasonable options;
(2) an environmental evaluation; and
(3) consultation with Federal and State resource management agencies regarding potential impacts and mitigation measures.

(c) WATER SUPPLY IMPACT ALTERNATIVES.—The study authorized by this section shall include a range of alternatives, all of which would investigate options that could reduce to insignificance any water supply impact on water users in the Sacramento River watershed, including Central Valley Project contractors, from any delivery of water out of the Sacramento River as referenced in subsection (a). In evaluating the alternatives, the study shall consider water supply alternatives that would increase water supply for, or in, the Sacramento River watershed. The study should be coordinated with the CALFED program and take advantage of information already developed within that program to investigate water supply increase alternatives. Where the alternatives evaluated are in addition to or different from the existing CALFED alternatives, such information should be clearly identified.

(d) HABITAT MANAGEMENT PLANNING GRANTS.—The Secretary of the Interior, subject to the availability of appropriations, is authorized and directed to provide grants to support local habitat management planning efforts undertaken as part of the consultation described in subsection (b)(3) in the form of matching funds up to $5,000,000.

(e) REPORT.—The Secretary of the Interior shall provide a report to the Committee on Resources of the United States House of Representatives and to the Committee on Energy and Natural Resources of the United States Senate within 24 months from the date of enactment of this Act on the results of the study identified in subsection (a).

(f) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to the Secretary of the Interior to carry out this section $10,000,000, which may remain available until expended, of which—
(1) $5,000,000 shall be for the feasibility study under subsection (a); and
(2) $5,000,000 shall be for the habitat management planning grants under subsection (d).

(g) LIMITATION ON CONSTRUCTION.—This section does not and shall not be interpreted to authorize construction of any facilities.

- Other diversions agreed on by the WFA signatories and potentially affected parties upstream on the Sacramento River. The SRWRS has identified water supply requests from two additional potential project partners:
    - Roseville – 7,100 AF per year from its PCWA water sale agreement for M&I use and groundwater recharge for enhancing system reliability
    - Sacramento – An additional diversion point for its water rights to improve system reliability and facilitate regional conjunctive use[4] in areas covered by its water right Place of Use (POU).

The authorizing legislation also includes Natomas Mutual Water Company (NMWC) fish screen improvements and a diversion consolidation, known as American Basin Fish Screen and Habitat Improvement Project (ABFSHIP). As a separate project, ABFSHIP finished its feasibility study in 2000, and NMWC, Reclamation, and the California Department of Fish and Game (CDFG) are conducting environmental reviews of the actions proposed in the study. Close coordination between the SRWRS and

[4] Conjunctive use is a water management action intended to increase total supplies and enhance water supply reliability by coordinated management of surface water and groundwater supplies.

ABFSHIP is necessary because both projects are planning diversions in close proximity on the Sacramento River. Their common study authorization, association with the WFA, and Federal lead agency status necessitates requiring compliance with the National Environmental Policy Act (NEPA), and warrants coordination for regional benefits. More details about ABFSHIP are provided in **Chapter 2**, and the need for coordination is further discussed in Chapter 7.

The authorizing legislation delineates the requirements of the feasibility study, including development of a range of reasonable alternatives, an environmental evaluation, and consultation with Federal and State resource management agencies about potential impacts and mitigation. In addition, Subsection (c) requires the Department of the Interior to include a range of alternatives with options for reducing to insignificance any water supply impacts on water users in the Sacramento River watershed (including CVP contractors) from water deliveries considered in the SRWRS. In evaluating the alternatives, the SRWRS shall, as stated in the legislation, "consider water supply alternatives that would increase water supply for, or in, the Sacramento River watershed. The study should be coordinated with the CALFED program and take advantage of information already developed within that program to investigate water supply increase alternatives. Where the alternatives evaluated are in addition to or different from the existing CALFED alternatives, such information should be clearly identified."

NEED FOR ACTION

The WFA included a solution package to achieve its two co-equal objectives: (1) providing a reliable and safe water supply for the region's economic health and planned development to 2030, and (2) preserving the fishery, wildlife, recreational, and aesthetic values of the lower American River. Local agencies and interested parties have been implementing measures from the WFA since its completion in 2000.

As part of the solution package, WFA signatories (including SRWRS cost-sharing partners) agreed to a set of diversion limitations on the American River, assuming a Sacramento River diversion that would provide additional needed water supply for planned development in the Placer-Sacramento region. The anticipated Sacramento River diversion would reduce a portion of future diversions from the American River and further contribute to preservation of the lower American River; however, infrastructure for this diversion does not currently exist.

Without a Sacramento River diversion, long-term water supply reliability in the Placer-Sacramento region would be significantly affected if the cost-sharing partners limit their diversions from the American per the WFA. If the first co-equal objective of the Water Forum (water supply reliability) is jeopardized, the second co-equal objective of preserving the lower American River also may become difficult to achieve.

STUDY AREA AND PURPOSE

The SRWRS study area includes the region in Placer and Sacramento counties, north of the American River and east of the Sacramento River (see **Figure 1-1**). The American River watershed (or drainage basin) encompasses about 2,100 square miles northeast of Sacramento and includes portions of Placer, El Dorado, and Sacramento counties. The American River is a tributary of the Sacramento River, and the Sacramento River watershed includes most northern California counties. Folsom Dam and Lake on the American River, and Shasta Dam and Lake on the Sacramento River, are CVP storage facilities owned and operated by Reclamation.

The purpose of the SRWRS is to develop a water supply plan that is consistent with the WFA objectives of pursuing a Sacramento River diversion to meet water supply needs of the Placer-Sacramento region, and promoting ecosystem preservation along the lower American River. Results from the SRWRS will be used as the basis for seeking necessary approvals and permits from the responsible resource agencies to allow execution of necessary agreements and construction of the recommended water supply infrastructure.

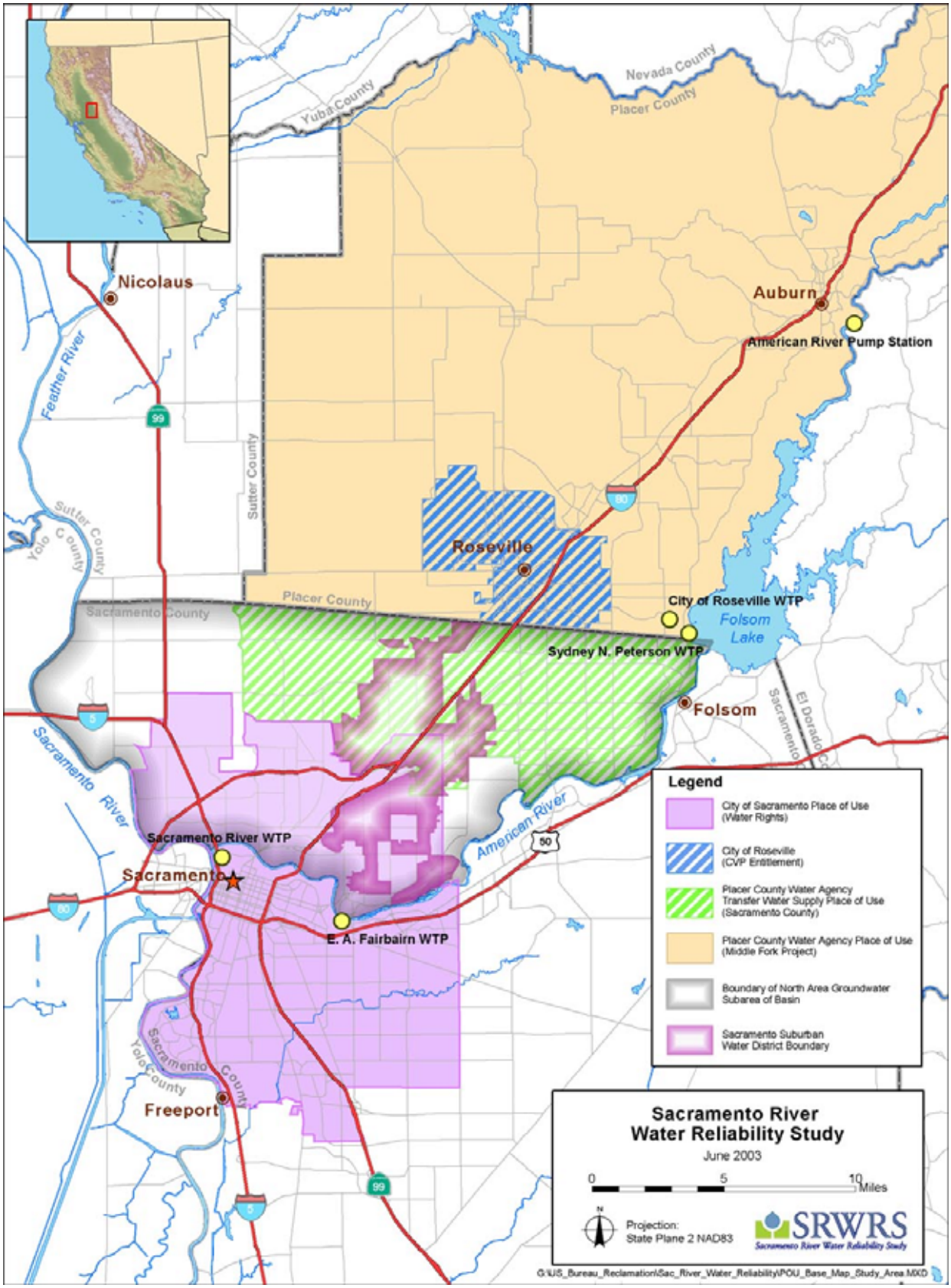


Figure 1-1. SRWRS Study Area Map

REPORT ORGANIZATION

This report is organized as follows:

- **Chapter 1, Introduction** provides background information on the SRWRS.

- **Chapter 2, Related Studies, Projects, and Programs** summarizes studies, projects, and programs related to the SRWRS, providing a context of historical development of the SRWRS and current regional collaboration and challenges.

- **Chapter 3, Without-Project Conditions** describes existing and future resource conditions that are considered in the SRWRS in identifying water and related resources problems and opportunities.

- **Chapter 4, Water and Related Resources Problems and Opportunities** summarizes the identified water supply reliability gaps that the SRWRS will address, and related resources opportunities that the SRWRS could contribute.

- **Chapter 5, Plan Formulation Approach** describes the overall planning approach to satisfy applicable Federal, State, and local requirements, including planning objectives and criteria to resolve the identified water supply reliability problems and facilitate identified resources opportunities.

- **Chapter 6, Development of Preliminary Alternatives** summarizes the study process of developing preliminary alternatives. A wide range of measures was considered and screened for potential contributions and challenges in meeting identified planning objectives. The preliminary alternatives were complete solution packages formulated by combining retained measures.

- **Chapter 7, Comparison of Preliminary Alternatives** compares preliminary alternatives based on results of technical analysis and public scoping and provides a list of alternatives for environmental review.

- **Chapter 8, Next Steps in SRWRS Development** summarizes preliminary findings, potential challenges, future actions, and the tentative project schedule.

- **Chapter 9, List of Preparers** lists individuals who helped prepare this document.

This **Initial Alternatives Report** also includes five appendices that provide additional details:

- **Appendix A, Assessment of Water Supply Needs** summarizes the relevant background for each cost-sharing partner, including corresponding legal authority, charter, service area, water rights and contract entitlements, and a preliminary assessment of future water supply needs based on corresponding planning policies and objectives.

- **Appendix B, Development of Preliminary Alternatives** summarizes the process of developing measures that partially meet water supply objectives identified in **Chapter 5** of this report. These measures were subsequently screened and resulting retained measures combined to become preliminary alternatives used for the scoping process and Phase 1 engineering design and environmental evaluation.

- **Appendix C, Phase 1 Engineering Report** provides the initial conceptual design for each preliminary alternative. This design information was used in the scoping process, Phase 1

Environmental Evaluation, and screening of preliminary alternatives described in **Chapter 7** of this report.

- **Appendix D, Phase 1 Environmental Evaluation** describes the initial assessment of environmental effects for each preliminary alternative. The results of this evaluation were used in the scoping process and screening of preliminary alternatives described in **Chapter 7** of this report.

- **Appendix E, Scoping Report** summarizes the scoping process and input received. These inputs were considered in the screening of preliminary alternatives described in **Chapter 7** of this report and will be considered in continued study development.

CHAPTER 2. RELATED STUDIES, PROJECTS, AND PROGRAMS

The concept of a Sacramento River diversion for water supply in the Placer-Sacramento region has been included in or related to many previous and ongoing local, regional, and statewide studies, projects, and programs. This chapter contains a summary of these related efforts.

PREVIOUS PROGRAM-LEVEL STUDIES

The concept of a Sacramento River diversion can be found in two programmatic studies: the American River Water Resources Investigation (ARWRI) conducted by Reclamation and Sacramento Metropolitan Water Authority[5] (SMWC), and the Sacramento Area Water Forum (Water Forum) conducted by local interest parties in the Placer-Sacramento region. Each of these program-level studies was performed to develop a comprehensive plan to address a complex suite of problems that could not be resolved by an individual project. The ARWRI concluded that the region has sufficient water rights and contract entitlements to meet the projected 2030 water demand, and identified an environmentally preferred alternative for future water supply needs that includes additional surface water diversions and regional conjunctive management. The WFA is a locally initiated, regional solution for developing a strategic plan that (1) provides a reliable and safe water supply for the region's economic health and planned development to 2030, and (2) preserves the fishery, wildlife, recreational, and aesthetic values of the lower American River. Both studies concluded that conjunctive use and groundwater management are supportable and sustainable alternatives for meeting future water supply needs.

Table 2-1 compares major components of these two programmatic studies and the SRWRS. The project-specific analysis of the SRWRS addresses the programmatic components of increased/new diversions and conveyance, and groundwater management and conjunctive management. Many efforts to address other programmatic components are being developed in parallel with the SRWRS.

Table 2-1. Comparison of Major Study Components

Major Study Components	ARWRI and EIS	WFA and EIR	SRWRS
Reservoirs and Conveyance	●		
Land Retirement	●		
Stanislaus River Transfer	●		
Reclamation	●	●	
Increased/New Diversions and Conveyance	●	●	●
Conservation Program	●	●	
Groundwater Management and Conjunctive Management	●	●	●
Reoperation of Upper American River Reservoirs		●	
Improved Flow Patterns for Fish		●	
Lower American River Habitat Management		●	
Lower American River Recreation Program		●	

[5] SWMC, now the Regional Water Authority, was established in 1990 to represent water purveyors in Sacramento, Placer, and El Dorado counties for providing a unified voice on regional water issues.

American River Water Resources Investigation

Reclamation and SMWA completed the ARWRI, which was documented in a Planning Report and Final EIS in 1997. The five ARWRI objectives included the following:

1. Manage groundwater basins and surface water supplies to maintain beneficial uses and protect water quality

2. Provide water to meet projected water demands in 2030, including M&I and agricultural demands in five counties (El Dorado, Placer, Sacramento, San Joaquin, and Sutter)

3. Provide flows sufficient for water-oriented recreation

4. Sustain the riverine and associated biological environment

5. Be consistent with ongoing activities addressing flood protection needs

Three alternatives were developed and analyzed for the water supply and environmental needs identified in the ARWRI EIS: No-Action Alternative, Auburn Dam Alternative, and Conjunctive Use[6] Alternative. The principal difference between the two action alternatives was the source of new yield. As the names imply, the Auburn Dam Alternative used Auburn Dam as the main source of additional water supply, while the Conjunctive Use Alternative had a large conjunctive management component. The "Common Elements" in both alternatives include a Feather River diversion for serving M&I demands in the Placer-Sacramento region, and other components that could be implemented by local water purveyors such as wastewater reclamation, conservation, new and/or expanded surface water diversions, and new surface water storage.

The ARWRI concluded that the Conjunctive Use Alternative was the environmentally superior alternative, but did not identify a Federal role for meeting future water demands within the ARWRI study area. However, Reclamation would assist local agencies with further study and/or implementing the Common Elements if provided with proper Congressional authorization and appropriation.

Sacramento Area Water Forum and the Water Forum Agreement

The Water Forum was created in 1993. The group comprises business and agricultural leaders, citizens groups, environmentalists, water managers, and local governments in the Sacramento region who joined together to meet two co-equal objectives:

1. Providing a reliable and safe water supply for the region's economic health and planned development to 2030

2. Preserving the fishery, wildlife, recreational, and aesthetic values of the lower American River

In 2000, Water Forum members approved the WFA, which consists of seven integrated elements necessary for a regional solution to water shortages, environmental damage, groundwater contamination, and limited economic prosperity.[7] These seven elements include the following:

---

[6] Conjunctive use is an operation that coordinates management of surface water and groundwater supplies to increase total water supplies and enhance water supply reliability.

[7] In October 1999, a programmatic EIR for the Water Forum Proposal (WFP) was completed. The WFP included the seven elements subsequently approved in the WFA. The EIR states that the WFP was the environmentally preferred alternative with significant and potentially significant impacts to the lower American River and Folsom Reservoir,

1. Increased surface water diversions
2. Actions to meet customers' needs while reducing diversion impacts in drier years
3. An improved pattern of fishery flow releases from Folsom Lake
4. Lower American River habitat management
5. Water conservation
6. Groundwater management
7. Water Forum Successor Effort

The WFA also included provisions to ensure that as each signatory fulfills its responsibilities, other signatories also honor their commitments. As part of these provisions, all signatories agreed to endorse, and where appropriate, participate in, a Sacramento River supply for north Sacramento County and Placer County. It was recognized that this additional surface water diversion would help meet a portion of some purveyors' needs in all years, and become an additional source of water for conjunctive use in the groundwater basin north of the American River. These water management actions could contribute to a reliable water supply for the area and reduce the needs for some purveyors to divert from the American River in dry years.

The groundwater management element prescribed in the WFA is a major step toward "actions to meet customers' needs while reducing diversion impacts in drier years" because it reinforces the sustainability of regional groundwater resources for dry-year supply. Signatories of the WFA will voluntarily leave surface water in the American River during "dry" years (i.e., forbear surface water diversions to which they are entitled), and use other water supply sources to meet water demands (e.g., groundwater, surface water diversions below the confluence of the American and Sacramento rivers, additional conservation, etc). Conversely, the signatories will maximize surface water diversions in "wet" years, allowing the groundwater basin to recover for use during the next dry cycle. Such a program requires modifying current water supply operations of local water purveyors and constructing additional facilities for surface water diversions, groundwater recharge and extraction, and associated conveyance systems to maximize the flexibility of the regional water supply envisioned by the WFA.

LOCAL AND REGIONAL STUDIES, PROJECTS, AND PROGRAMS

Related local and regional activities can be largely grouped into two categories: activities associated with WFA implementation and activities affecting water supply conditions or related to water supply development in Placer-Sacramento region.

Water Forum Agreement Implementation

Implementation of the elements prescribed in the WFA continues to be pursued through local and regional studies, projects, and programs. Each ongoing effort described below is directly related to a Sacramento River diversion in its water management strategy.

including effects on certain fisheries, recreational opportunities, and cultural resources. Potential mitigation measures were identified as a part of the lower American River habitat management element of the WFA.

Regional Water Master Plan (American River Basin Cooperating Agencies)

In 1998, water purveyors in southern Placer County and northern Sacramento County formed the American River Basin Cooperating Agencies (ARBCA) and began to implement the regional conjunctive management program envisioned by the Water Forum. A Regional Water Master Plan (RWMP) was developed in 2002 to conclude these efforts. The RWMP identifies project and program alternatives for implementing elements of the conjunctive use program prescribed by the WFP to achieve the following goals and objectives:

- **Provide Desired Water Supply Reliability**. Establish specific water supply reliability goals that are practical, cost-effective, and acceptable to the users of the American River and the adjacent groundwater basin, and identify operational agreements and, potentially, new facilities that will meet those reliability goals.

- **Provide High-Quality Water.** Establish water quality goals for the principal water uses of ARBCA and deliver water supplies that meet these goals for potable and other appropriate water uses.

- **Protect Economic Interests.** Protect the long-term economic interests and financial investments of ARBCA (and others).

- **Develop an Implementable Plan.** Develop a plan that elicits support from ARBCA and its customers, adjacent agencies, stakeholder groups, and the public, and is physically, economically, and politically implementable.

Alternatives developed through the RWMP encompass a range of facilities, operations, and institutional mechanisms. Although most of these projects and programs could be implemented on a stand-alone basis, every effort was made to identify opportunities for cooperative action. Facilities for a Sacramento River diversion for SRWRS cost-sharing partners were identified in the RWMP as the only major facilities which have not been built that are essential for achieving desired water supply reliability and regional conjunctive use in northern Sacramento and western Placer areas.

Subsequent implementation of the RWMP is being carried out by local water purveyors, the Sacramento Groundwater Authority (SGA), and the Regional Water Authority (RWA). The SGA is a joint-powers authority (JPA) formed pursuant to recommendations of the WFA, and charged with protecting and regulating the groundwater basin underlying northern Sacramento County. The RWA is a JPA charged with serving and representing the regional water supply interests of its members by protecting the reliability, availability, and quality of water resources.

American River Basin Regional Conjunctive Use Program (Regional Water Authority)

The RWA American River Basin Regional Conjunctive Use Program (ARBCUP) is a $43 million project to build and upgrade water facilities throughout the region to better manage surface and groundwater resources. ARBCUP brought together seven local water purveyors - Citrus Heights Water District, Fair Oaks Water District, PCWA, San Juan Water District (SJWD), SSWD, Roseville, and Sacramento - to transform individual projects into a regional conjunctive use plan.

ARBCUP's objectives include (1) improving the flexibility of the local water system, (2) helping preserve the groundwater basin for use in drought years, (3) promoting implementation of the WFA, and (4) exploring options for future State or Federal partnerships to provide broader, system-wide benefits. The project's 12 program components include new pipelines, pumps, and other facilities to store, treat, and convey water throughout the region. Once implemented, ARBCUP is expected to increase the region's water supplies by more than 20,000 AF of water annually with reduced cost to ratepayers. As a major regional approach, this program has received a grant from the California Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act of 2000 (Proposition 13) for 50 percent of the project implementation cost.

Water Facilities Expansion Project (Sacramento)

Sacramento currently has two water treatment plants (WTP): (1) the E.A. Fairbairn WTP (Fairbairn WTP), which diverts water from the American River, and (2) the Sacramento River WTP, which diverts water from the Sacramento River below its confluence with the American River. In November 2000, Sacramento completed an EIR for expanding these two WTPs. Expansion of the Sacramento River WTP from 110 million gallons per day (mgd) to 160 mgd was recently completed; expansion of the Fairbairn WTP from 90 mgd to 200 mgd is scheduled to be completed in 2005.

Per its WFA Purveyor Specific Agreement (PSA), Sacramento would reduce its American River diversion at the Fairbairn WTP by up to 100 mgd during low-flow conditions or critically dry years. Expanding the Sacramento River WTP would allow diversions to be shifted from the American River to the Sacramento River, alleviating environmental concerns regarding the use of the new treatment capacity for additional American River diversions during low-flow conditions. However, due to the location and limitations on available land, the expanded Sacramento River WTP only would recover part of the water supply reliability lost to diversion limitations at the Fairbairn WTP per Sacramento's WFA PSA.

Groundwater Stabilization Project (PCWA, SSWD)

The Groundwater Stabilization Project is an integral part of the conjunctive management program envisioned in the WFA to stabilize the overdrafted groundwater basin beneath the Sacramento-Placer region. This project would provide up to 29,000 AF of surface water per year to an area that has historically relied on groundwater. PCWA and SSWD finalized an EIR for the Groundwater Stabilization Project in 1998, and Implementation of the project began in 2000 through a water sale agreement between PCWA and SSWD for delivering Middle Fork Project[8] (MFP) water at Folsom Dam.

The PCWA-SSWD water sales agreement specifies a schedule of diversion amounts that begins at 7,000 AF in 2000, reaches 29,000 AF in 2014, and continues at that amount for the remainder of the agreement period. The WFA further restricts SSWD's American River diversion of PCWA's MFP water after 2010 in hydrologic years with unimpaired inflow to Folsom Lake of less than 1,600,000 AF from March through November. This restriction anticipates a Sacramento River diversion, which could provide surface water to SSWD during other years to fully realize potential opportunities for conjunctive use and groundwater stabilization.

American River Pump Station Project (Reclamation, PCWA)

The objectives of the American River Pump Station (ARPS) project include (1) providing facilities that would allow PCWA to divert up to 35,500 AF per year of its MFP water rights, (2) eliminating a safety issue associated with the Auburn Dam bypass tunnel, and (3) allowing for all pre-Auburn-Dam-construction beneficial uses of water in what is now the dewatered river channel (e.g., recreation, navigation, and other instream beneficial uses). Reclamation and PCWA completed a final EIS/EIR in June 2002 for this project. PCWA approved the project in July 2002, and Reclamation issued a Record of Decision (ROD) for project implementation in September 2002. Construction started in late 2003 and the anticipated completion date is in 2006. Prior to construction, Reclamation and PCWA entered into a contract that outlines the protocol for transferring the titles of ARPS facilities and easements after construction is completed.

[8] The MFP is owned and operated by PCWA as a multipurpose project designed to conserve and control waters of the Middle Fork American River, the Rubicon River, and certain tributaries for irrigation, domestic, commercial, and recreational purposes and for generating electricity. The French Meadows and Hell Hole reservoirs are two major storage facilities of the MFP.

American Basin Fish Screen and Habitat Improvement Project (NMWC)

The American Basin Fish Screen and Habitat Improvement Project (ABFSHIP), supported by funding from the Central Valley Project Improvement Act (CVPIA) Anadromous Fish Screen Program (AFSP) and CALFED Environmental Restoration Program (ERP), is to consolidate five existing diversions of Natomas Mutual Water Company (NMWC) and one other diversion of local riparian water right holders on the Sacramento River into one or two new diversion facilities with fish screens. The WFA recommends the consolidation and screening of these diversions to benefit the environment and Sacramento River fisheries.

NMWC completed a Feasibility Study Technical Report for ABFSHIP in 2000. Currently, NMWC, Reclamation (NEPA lead agency) and CDFG (California Environmental Quality Act (CEQA) lead agency) are preparing an EIS/EIR for ABFSHIP. As a project supported by CALFED funding, ABFSHIP is currently undergoing an environmental review process and is developing an Action Specific Implementation Plan (ASIP) for its proposed actions. All three action alternatives under consideration (Sankey/Elkhorn Diversions, Sankey Diversion, and Prichard Diversion) include a total screened diversion capacity of 644[9] cfs, removal of a dam at the mouth of the Natomas Cross Canal (NCC), improvements to NMWC's canal distribution system, and corresponding revised operation for water delivery. The Sankey/Elkhorn Diversions alternative is the proposed action under the ASIP process. The final decision(s) on ABFSHIP will be made after completing the environmental compliance process in late 2005.

PL 106-554 authorized a feasibility study for a Sacramento River diversion with facilities considered under both the SRWRS and ABFSHIP; however, these two studies have been developed as separate projects. ABSHIP was already under development when SRWRS was authorized.

Lower American River Flow Management Standards

Water Right Decision 893 (D-893) contains minimum instream flow provisions for protecting beneficial uses, including fish, in the lower American River. In 1972, the California State Water Resources Control Board (SWRCB) issued D-1400, setting fishery flows for the American River higher than those in D-893 as a condition of permits for the proposed Auburn Dam. Auburn Dam was never constructed, and the D-1400 flows were never imposed. Reclamation currently implements modified D-1400 flows that incorporate the flow objectives of the Anadromous Fish Restoration Program (AFRP) pursuant to the CVPIA. The subject of water rights and instream flows was addressed in a January 2, 1990, judgment of the Superior Court for the County of Alameda (*Environmental Defense Fund, Inc. v. East Bay Municipal Utility District*, Case No. 425955), known as the Hodge Decision.

The Hodge Decision directed the East Bay Municipal Utility District (EBMUD) to divert from the lower American River based on its CVP contractual entitlement only when specified flows, known as the Hodge Flows, would remain in the river. Hodge flows are 2,000 cubic feet per second (cfs) from October 15 through the end of February, 3,000 cfs from March 1 through June 30, and 1,750 cfs from July 1 through October 14. Although the Hodge Decision applies only to parties to that lawsuit, WFA signatories (such as Sacramento) volunteer to observe the flow requirements when reasonable and feasible alternatives exist to recover from resulting loss of water supply reliability. Pursuant to the WFA, the Water Forum has developed a proposed Flow Management Standard (FMS) through implementing two WFA elements: Improved Pattern of Fishery Flow Releases from Folsom Reservoir, and Lower American River Habitat Management. The

[9] The Sankey/Elkhorn Diversions alternative would include a 434-cfs diversion near Sankey Road and a 210-cfs diversion near existing NMWC's Elkhorn diversion; the Sankey Diversion alternative would have a 644-cfs diversion near Sankey Road; the Prichard Diversion alternative would have a 644-cfs diversion near Prichard Lake.

primary purpose of the FMS is to maximize the annual production and survival of the anadromous fall-run Chinook salmon and steelhead in the lower American River, with water availability constraints, and consider Reclamation's obligation to provide for multipurpose, beneficial uses of Folsom Dam and Reservoir.

In 2004, Reclamation, the United States Fish and Wildlife Service (USFWS), and Water Forum entered into a Memorandum of Understanding (MOU) on the process for developing an FMS and related information to be forwarded to the SWRCB for consideration regarding amending Reclamation's water right permits. The tentative schedule suggests the process may be completed in 2005. Similar to the SRWRS, the FMS is part of the water management measures in the WFA for protecting the ecosystem of the lower American River.

Central Sacramento County Groundwater Forum

The Central Sacramento County Groundwater Forum (CSCGF) was initiated in 2002 to carry out a portion of the Water Forum's mission to develop mutually agreed-on recommendations for protecting the health and viability of the central Sacramento County groundwater basin for both current users and future generations. Members of the CSCGF include the Water Forum Successor Effort, California Department of Water Resources (DWR), water purveyors, local governments, and public agencies in the region, and groups of agricultural, residential, business, environmental and community interests. Similar to SGA, CSCGF is to develop a common vision among participants to develop a solution package for conjunctive management in the central Sacramento County groundwater basin between the American and Cosumnes rivers and east to the Sacramento River.

Other Related Local and Regional Studies, Projects, and Programs

The following activities are related to the SRWRS because of their connection to the water supply of the SRWRS cost-sharing partners, and their significance in regional planning efforts.

Aerojet Superfund Site Cleanup (Aerojet General Corporation)

Sacramento region has several Superfund sites, notably the Sacramento Army Depot, Mather Air Force Base (AFB), McClellan AFB, and Aerojet General Corporation (Aerojet). Of these sites, the Aerojet Superfund Site poses the greatest threat to the regional groundwater system.

The Aerojet Superfund Site encompasses 5,900 acres near Rancho Cordova, 15 miles east of Sacramento. The northeastern edge of the site is about 1/2 mile from the American River. In 1979, volatile organic compounds (VOC) were found off site in private wells, and also were found in the American River in 1983. Perchlorate, a component of solid rocket fuel, was found in January 1997 at levels above the provisional reference dose range in drinking water wells off site. The plume of contaminants from the site is moving generally toward the southwest, corresponding to the topography and underlying geological formations, and had been reported previously only in areas south of the American River. As an interim measure, between 1983 and 1987, five groundwater extraction and treatment facilities were installed as a barrier system to prevent further off-site movement of VOCs. However, concern about impacts to water supply wells was heightened by recent sampling of existing wells in May 2004, which showed that the contaminant plume extends northwest underneath the American River and below the southern edge of Carmichael.

Communities potentially affected by Aerojet pollution include Rancho Cordova, Carmichael, Fair Oaks, and Sacramento. Groundwater is used extensively throughout these communities to supply municipal, domestic, industrial, and some irrigation water. Public and private drinking water supply wells have been contaminated. Wells contaminated above action levels have been shut off. Aerojet continues to monitor drinking water supplies to assure compliance with drinking water standards with oversight by the California Department of Health Service (DHS). Additional concerns also exist for nearby Lake Natoma and Alder Creek, which are used for recreation, and the American River, which is used for public water supplies and

recreation. As a result of the Aerojet contamination, water purveyors in the affected area are currently developing solutions for replacing the lost water supply.

Joint Sacramento City-County Natomas Vision General Plan Amendment Project (Sacramento-County of Sacramento)

Sacramento and the County of Sacramento entered into an MOU in December 2002 for developing and implementing a joint Sacramento City-County Natomas Vision General Plan Amendment Project (Natomas Joint Vision). These parties have mutual policy and economic interests in accommodating limited long-term development while permanently preserving open space within the Natomas area. This area is currently designated agriculture/open space in the Sacramento County General Plan and no new land uses are proposed at this time.

Sacramento issued a Notice to Proceed (NOP) in October 2003 for preparing an EIR for the consequent Natomas Joint Vision, which covers about 25,000 acres in an unincorporated area of Natomas. Although the EIR is being undertaken primarily to evaluate Sacramento's General Plan amendment, the County of Sacramento also will use the EIR for adopting its General Plan amendment to create basic policies for the Natomas area.

The proposed policies considered in the Natomas Joint Vision are intended to promote agriculture viability, permanent open space and habitat conservation, Sacramento International Airport protection, and long-term development consistent with the "smart growth" principles shared by Sacramento and the County of Sacramento. Particularly, three special areas would be established:

1. Areas of Concern — These unincorporated areas would be directly related to Sacramento's long-range planning effort and thus, actions in these areas require active cooperation and coordination between Sacramento, the County of Sacramento, and other jurisdictions. The Areas of Concern include the permanent open space/agricultural mitigation area for the Natomas Joint Vision.

2. Urban Reserve – This area is outside Sacramento's current Sphere of Influence (SOI) in which future development and extension of municipal services are contemplated but not imminent.

3. Community Separator — These are open space areas used for creating clear separation between communities, defining the transition between urban and rural uses, and providing gateways that define entrances to the city. A greenbelt is proposed near the county line to separate Sutter County and the Urban Reserve area.

If the amendments are approved, Sacramento will work with the Sacramento County Local Agency Formation Commission (SacLAFCo) and County of Sacramento to revise its SOI to include the Urban Reserve area. It is anticipated that the final EIR and proposed General Plan amendments would require several years of effort; thus, the water supply plan for this planning area is excluded from consideration in the SRWRS.

Redundant Water Supply Outlet at Folsom Dam (United States Army Corps of Engineers, Roseville)

This study and potential implementation were authorized in the 1992 Water Resources Development Act (WRDA, PL 102-580), as amended in the 1996 WRDA (PL 104-303) and 1999 WRDA. The United States Army Corps of Engineers (USACE) and Roseville are the Federal and non-Federal cost-sharing partners for this effort. Roseville also has a third-party agreement for cost-sharing with SJWD and the City of Folsom (Folsom).

The planned redundant water supply outlet is to provide redundancy to raw water supply systems of Roseville, SJWD, and Folsom to increase reliability, provide water during required maintenance and emergency outages of the existing outlet works, and to address security concerns. The outlet will not be used for additional water supply on a regular basis.

Currently, Roseville, SJWD, and Folsom divert water at Folsom Dam through an outlet works located in Block No. 7 of the concrete gravity dam near the right abutment. The 84-inch-diameter outlet conduit is protected at the upstream face by trashracks. In 2003, the intake was retrofitted with a multilevel inlet temperature control device (TCD) for the purpose of controlling water temperature. Flow through the outlet bifurcates into an 84-inch-diameter pipeline for delivery to Roseville and SJWD, and a 42-inch-diameter pipeline for delivery to Folsom. Pumping is controlled by the Folsom Pumping Plant, which is equipped with six pumps with a total capacity of 400 cfs, and located on the right abutment just downstream of the dam above the powerhouse. The intake, conveying pipeline, and pumping plant are owned and operated by Reclamation.

Comprehensive maintenance of the existing primary intake structure and pipeline is not possible without establishing an adequate redundant water supply system. The study has identified the proposed action to install a redundant outlet by tapping into the sides of existing power penstocks No. 2 and No. 3, and to construct a necessary pipeline to the existing pumping station. Environmental documentation is expected in early 2005 with construction potentially starting in late 2005.

Reoperation of Folsom Dam and Reservoir (Reclamation, Sacramento Area Flood Control Agency)

In 1995, the Sacramento Area Flood Control Agency (SAFCA) and Reclamation entered into a "Contract Between the United States of America and the Sacramento Area Flood Control Agency Concerning the Operation of Folsom Dam and Reservoir" (Interim Agreement). The Interim Agreement improved flood control operations in the American River watershed by increasing the storage space available to contain winter flood flows in Folsom Reservoir whenever such space is unavailable in the three largest upstream non-Federal reservoirs (French Meadows, Hell Hole, and Union Valley). This variable storage space operation requires Reclamation to provide a minimum of 400,000 AF and a maximum of 670,000 AF of flood control storage (400/670) in Folsom Reservoir during the November through March flood season. The Interim Agreement was initially for a 5-year period (i.e., 1995 through 1999) and expired in October 1999. Since 1999, it has been extended on a yearly basis.

In the 1996 WRDA (PL 104-303), Congress directed the Secretary of the Interior to continue operating Folsom Dam and Reservoir with the variable 400/670 flood control space and to extend the agreement between Reclamation and SAFCA with respect to the watershed until such time as a comprehensive flood damage reduction plan for the American River watershed is implemented. The comprehensive flood damage reduction plan has been developed under USACE's American River Watershed Project, in which long-term operation with the 400/670 flood control space was assumed.

SAFCA and Reclamation completed an EIR/Environmental Assessment (EA) for the Interim Agreement in 1994. The 1994 EIR/EA considered the potential effects of the modified flood control operation for a 12-year term (through 2006). Pursuant to requirements of CEQA, SAFCA prepared a Program Environmental Impact Report on Flood Control Improvements along the Mainstem of the American River (Program EIR) in March 2000 to analyze potential effects of continuing the 400/670 variable space storage operation. Currently, Reclamation is preparing an EA to complement SAFCA's 2000 Program EIR, and identify conditions that changed after the 1994 EIR/EA.

Major relevant changes after the 1994 EIR/EA contained in the Program EIR and EA (under development) include water quality requirements at the Sacramento-San Joaquin Delta (Delta) per D-1641, CVPIA implementation, and listing under the Federal Endangered Species Act (ESA) additional endangered or threatened species that depend in part on the lower American River. SAFCA's Program EIR suggests that

these changed conditions have limited the operational flexibility of the CVP and concentrated the impacts of the 400/670 variable storage space operations to a greater degree in the lower American River than anticipated. Findings from the Program EIR and EA would be used to formulate a long-term agreement for reoperation.

American River Watershed Investigation (USACE, Reclamation Board, SAFCA)

Effects of a flood that occurred in 1986 raised concerns over the adequacy of the existing flood control system, and initiated more than a decade of efforts for improving flood protection in the Sacramento area. Because of their emphasis on flood protection, water supply benefits from these projects are minimal; however, physical modifications included in these projects may affect opportunities for developing new water supply infrastructure.

USACE, the Reclamation Board, and SAFCA completed an initial feasibility study report in 1991 for the American River Watershed Investigation. Congress authorized construction for much of the work identified in the Natomas area, as described in the initial feasibility study report, but directed that additional studies be conducted to identify a project for increased flood protection along the American River. Subsequently, USACE, the Reclamation Board, and SAFCA developed a 1996 Supplemental Information Report (SIR) and Supplemental EIS/EIR to provide additional information, and several authorizations resulted for implementing selected features recommended in the SIR.

Common Features

In the 1996 WRDA (PL 104-303), Congress authorized construction of features common to the three candidate plans identified in the SIR: Folsom Modification Plan, Folsom Stepped Release Plan, and the Detention Dam Plan. Authorized implementation included construction of slurry walls in the levees along the lower American River, levee modifications along the east bank of the Sacramento River downstream from the NCC, installation of telemeter streamflow gauges upstream from the Folsom Reservoir, and modifications to the flood warning system along the lower American River.

The plan for levee modifications along the east bank of the Sacramento River is to raise and strengthen approximately 12.1 miles of the Sacramento River east (left) bank levee, south of the NCC, which is located approximately at river mile (RM) 78.0 on the left bank. This effort is currently being studied and designed under USACE and the State Reclamation Board.

As an alternative approach to resolving the Natomas levee erosion problem, SAFCA is currently conducting a feasibility study for setting back the Sacramento River east bank levee, from the NCC to the first waterside home, for a total distance of approximately 1.5 miles. Setting back this reach of levee could have added benefits as it also would serve as mitigation for corrective actions at other erosion sites. Coordination with ABFSHIP and the SRWRS would be required after preliminary results of this feasibility study become available in 2005.

Folsom Dam Modification

The Folsom Dam Modification Project includes modifications of outlet works and surcharge storage. Construction of these two components is being phased for several reasons. First, design and construction of the outlet works modification component would take about 6 years and can be accomplished with few adverse social or environmental effects. Second, modification of the use of surcharge storage would provide additional flood control space in the reservoir. Many of the project features that would be needed to implement surcharge also may be needed to implement raising Folsom Dam, one of the alternatives being investigated in the American River Watershed Investigation Long-Term Study. However, some features would be different. If modified use of surcharge is constructed now, Long-Term Study features such as the new emergency spillway tainter gates and dikes may have to be modified again. Phased construction will

allow ample time for a final decision to be made on recommended actions from the American River Watershed Investigation Long-Term Study. Once the Folsom Modification Project is complete, USACE would revise the Water Control Manual for Folsom Dam. The tentative schedule for completing proposed modifications is in 2009, according to the August 2001 Final Limited Reevaluation Report prepared by USACE.

Folsom Dam Mini-Raise

The 2003 WRDA authorizes Folsom Dam Mini-Raise of 7 feet, which would enable Sacramento's flood control system to handle storms far larger than any recorded event in the American River watershed. The mini-raise has broad support at the local, State, and Federal levels. Details of implementation are under development.

Regional Conservation Plan Development

To accommodate rapid urbanization in the Placer-Sacramento region, land use authorities are developing regional conservation plans for a comprehensive and balanced approach to habitat conservation and urban development. These efforts include developing a Natural Communities Conservation Plan (NCCP) per Section 2800 et. seq. of the California Fish and Game Code, and/or a Habitat Conservation Plan (HCP) per Section 10 of the 1973 ESA. As a part of developing these two conservation plans, many agencies include conditions for satisfying permitting requirements related to wetland impacts per Section 404 of the Clean Water Act (CWA 404 Permit), and other permit requirements to further streamline the permitting process for anticipated land use development.

Natomas Basin Habitat Conservation Plan

The Natomas Basin Habitat Conservation Plan (NBHCP), developed in 2002 by Sacramento, Sutter County, and the Natomas Basin Conservancy, applies to the 53,341-acre interior of the Natomas Basin, located in the northern portion of Sacramento County and the southern portion of Sutter County. The basin contains incorporated and unincorporated areas within the jurisdictions of Sacramento, and the counties of Sacramento and Sutter. Although most of the basin is currently used for agriculture, urbanized areas also exist, as in the southern portion of the basin, which contains Sacramento International Airport, Metro Air Park, and Sacramento's North Natomas Community Plan area.

The purpose of the NBHCP is to promote biological conservation along with economic development and continuation of agriculture within Natomas Basin. The NBHCP establishes a multispecies conservation program to mitigate the expected loss of habitat values and incidental take of protected species that would result from urban development, operation of irrigation and drainage systems, and rice farming. A draft EIS/EIR was prepared in 2002; however, its implementation has been delayed by pending litigation.

Placer County Natural Community Conservation Plan and Habitat Conservation Plan

Placer County Planning Department currently is preparing an NCCP/HCP. Development of this NCCP/HCP, as part of the Placer Legacy Open Space and Agricultural Conservation Program, consists of three phases. Phase 1 of the NCCP/HCP development focuses on conservation strategies for the fast-developing flat land and lower foothills of the Sierra Nevada in western Placer County. Phase 2 will cover the upper foothills of the Sierra Nevada and rapidly developing areas east of the Sierra crest, and Phase 3 will include public and private timberlands in the Sierra Nevada. The draft conservation plan is scheduled to be released in 2004, and the financial analysis and environmental review process completed in 2005.

South Sacramento Habitat Conservation Plan

Sacramento County Municipal Services Agency's Department of Planning and Community Development is preparing a multispecies, multihabitat South Sacramento HCP (SSHCP) to consolidate environmental efforts for protecting and enhancing wetlands (primarily vernal pools) and upland habitats, and providing ecologically viable conservation areas. The SSHCP encompasses about 341,000 acres in south Sacramento County, including the unincorporated area bounded by Highway 50 to the north, the county line to the east and south (excluding the Delta), and Interstate 5 to the west. Release of the draft SSHCP is scheduled for late 2004, and environmental review will be completed in 2005.

STATEWIDE STUDIES, PROJECTS, AND PROGRAMS

The limited water resources in California are highly utilized for different beneficial uses. The development of the SRWRS would need to consider relevant studies, projects, and programs that may potentially affect water availability or environmental considerations.

Sacramento-San Joaquin River Basins Comprehensive Study (USACE, Reclamation Board)

In response to extensive flooding and damages experienced in January 1997, Congress authorized USACE to provide a comprehensive analysis of the Sacramento River and San Joaquin River basins flood management systems, and to partner with the State of California to develop master plans for flood management. USACE and the Reclamation Board are leading the Sacramento-San Joaquin River Basins Comprehensive Study (Comprehensive Study) to improve flood management and integrate ecosystem restoration in the Sacramento and San Joaquin river basins.

The objectives of the Comprehensive Study are to identify problems and opportunities, set planning objectives and priorities, and develop potential measures to address flood damage reduction and ecosystem restoration. The study would examine a full range of structural and nonstructural measures and strategies. The basin master plans would include implementation plans and supporting programmatic environmental documentation. In the Sacramento region, the Comprehensive Study is working closely with SAFCA in evaluating and implementing flood control options on the American River and in the Natomas Basin.

Operations of CVP and SWP

The CVP is a multipurpose project operated by Reclamation that stores and transfers water from the Sacramento River, San Joaquin River, and Trinity River basins to the Sacramento, San Joaquin, and Santa Clara valleys. The CVP was authorized by Congress in 1937, and operates as an integrated system to serve water supply, hydropower generation, flood control, navigation, fish and wildlife, recreation, and water quality control purposes. The CVP service area extends about 430 miles through much of California's Central Valley, from Trinity and Shasta reservoirs in the north to Bakersfield in the south. The CVP also includes the San Felipe Unit, which delivers water to the Santa Clara Valley.

The State Water Project (SWP) is a multipurpose project operated by DWR. Thirty agencies throughout California have contracted with the SWP for an annual 4.2 million AF of water. Existing SWP facilities can supply less than 2.4 million AF during drought conditions. Additional facilities are planned to increase supply. Since 1962, the SWP has delivered water from Lake Oroville in the Feather River watershed through the Delta to the San Francisco Bay area, the San Joaquin Valley, a portion of coastal areas, and southern California.

The statewide water supply is largely controlled by operations of the CVP and SWP in accordance with applicable water rights, contract entitlements, and regulatory requirements. Conflicts exist as limited water resources are allocated among increasing demands in consumptive and nonconsumptive uses (including environmental needs). Thus, many previous and ongoing statewide efforts focus on developing solutions to

these conflicts. Development of the SRWRS must consider statewide water supply conditions not only because a portion of the diversions considered under the SRWRS are CVP contract entitlements, but also because the SRWRS may be affected by implementation of other previous or ongoing statewide efforts such as the CVPIA, CALFED, and the Sacramento Valley Water Management Program (SVWMP).

Coordinated Operation Agreement

The CVP and SWP use the Sacramento River and the Delta in common as conveyance facilities. Reservoir releases and Delta exports must be coordinated to ensure that the projects operate according to agreed-on procedures. The Coordinated Operation Agreement (COA) between the United States and DWR to operate the CVP and SWP was signed in November 1986. Under the COA, Reclamation and DWR agreed to operate the CVP and SWP in a manner to meet Sacramento Valley and Delta needs while maintaining their respective annual water supplies as identified in the agreement.

Coordination between these two projects is facilitated through an accounting procedure based on the sharing principles outlined in the COA. When water must be withdrawn from storage to meet Sacramento Valley and Delta requirements, 75 percent of the responsibility is borne by the CVP and 25 percent by the SWP. The COA also provides that when unstored water is available for export, 55 percent of it is allocated to the CVP and 45 percent is allocated to the SWP.

Although the principles in the COA were intended to cover a broad range of conditions, changes introduced by past biological opinions (BO) from the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA Fisheries) and USFWS, D-1641, and the CVPIA were not specifically addressed by the COA. Instead, these variances have been addressed by Reclamation and DWR through mutual informal agreement.

Operations Criteria and Plan

In June 2004, Reclamation prepared a Long-Term CVP Operations Criteria and Plan (OCAP) to update the proposed CVP operation in view of changes in regulations, increases in system demand, and anticipated new programs/projects coming on-line in the future. (The last version of OCAP was dated 1992.) Implementation of the revised OCAP is subject to ESA consultation, which was recently concluded in October 2004.

SWP operation is not subject to the OCAP; however, because of necessary coordination between the CVP and SWP, the biological assessment (BA) for the ESA consultation was jointly prepared by Reclamation and DWR to address potential effects of long-term CVP and SWP operations.

This consultation includes several actions with a completed or ongoing environmental review process such as the Freeport Regional Diversion Project, the intertie between the California Aqueduct and Delta-Mendota Canal, the South Delta Improvement Program (SDIP), Long-Term Environmental Water Account (EWA). The significance of the SDIP is that it may officially increase the current Delta export pumping capacity at the Banks Pumping Plant from 6,680 cfs to 8,500 cfs. Several actions with previously completed environmental review processes also were included in this consultation, such as the 2000 Trinity River ROD, AFRP flow objectives, the 1993 Winter Run BO, the revised decision on CVPIA Section 3406(b)(2) water, EWA, the Joint Point of Diversion (JPOD), and the Draft Proposition Concerning CVP/SWP Integrated Operation (also known as the Napa Proposition).

Central Valley Project Improvement Act

The CVPIA was included in the Reclamation Projects Authorization and Adjustment Act of 1992 (PL 102-575) as Title XXXIV. The CVPIA amends previous authorizations of the CVP by designating fish and

wildlife protection, restoration, and mitigation as project purposes equal in priority with irrigation and domestic water supply uses, and giving fish and wildlife enhancement equal priority with power generation.

Major areas of change stipulated in the CVPIA include 800,000 AF of water dedicated to fish and wildlife annually (also known as (b)(2) water); tiered water pricing applicable to new and renewed contracts; water transfers provision, including sale of water to users outside the CVP service area; special efforts to restore anadromous fish population; restoration fund financed by water and power users for habitat restoration and enhancement and water and land acquisitions; no new water contracts until fish and wildlife goals are achieved; no contract renewals until completion of a Programmatic EIS (PEIS); terms of contracts reduced from 40 to 25 years with renewal at the discretion of the Secretary of the Interior; installation of the TCD at Shasta Dam; implementation of fish passage measures at Red Bluff Diversion Dam; firm water supplies for Central Valley wildlife refuges; and development of a plan to increase CVP yield.

The Final PEIS for CVPIA implementation was completed in October 1999, and Reclamation subsequently issued a ROD in January 2001 for implementing the recommended plan.

(b)(2) Water

Implementation of the CVPIA (b)(2) provision has been a contentious process, marked by conflict between Federal and State parties, and substantial litigation. The primary dispute has been whether (b)(2) water translates into an automatic reduction in exports under water supply contracts. In May 2003, Reclamation released a final decision on implementation of Section 3406 (b)(2). The decision incorporates parts of an earlier decision (U.S. Department of the Interior 1999 Final Decision), modifies other decisions, and adds new components. The intent of these changes was to simplify and clarify the accounting process for (b)(2) water uses and to integrate (b)(2) water dedication and management with CVP operations for other CVP purposes.

Trinity River Restoration Plan

In December 2000, the Secretary of Interior issued a ROD documenting selection of actions necessary to restore and maintain the anadromous fishery in the Trinity River. This ROD was the culmination of a nearly 20-year process of detailed scientific efforts. The Trinity ROD implements a component of the CVPIA (Section 3406(b)(23)) intended to meet Federal trust responsibilities for protecting the fishery resources of the Hoopa Valley Tribe, and to meet the fishery restoration goals of PL 98-541 (October 24, 1984). The ROD adopts a preferred alternative that includes restoration and perpetual maintenance of the Trinity River's fishery resources, which would result in rehabilitation of the river itself through restoration of the attributes that produce a healthy, functioning alluvial river system. The preferred alternative reduced the average annual export of Trinity River water from 74 percent of flow to 52 percent.

Major components of the selected course of action include (1) a variable annual instream flow for the Trinity River ranging from 369,000 to 815,000 AF per year, (2) physical channel rehabilitation, (3) sediment management, including supplementation of spawning gravels, (4) watershed restoration efforts, and (5) river infrastructure improvements. Implementation of the ROD was delayed by litigation, but resumed after a Ninth Circuit Court ruling in July 2004 to uphold the ROD flow schedule.

Anadromous Fish Restoration Program

The CVPIA directed the Secretary of the Interior to amend previous authorizations of the CVP to "include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic use and fish and wildlife enhancement as a project purpose equal to power generation."

Section 3406(b)(1) of the CVPIA directs the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to at least double natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis. The primary resulting program is known as the AFRP. In 2001, USFWS prepared a Final Restoration Plan for the AFRP. The program relies heavily on local involvement and partnerships with property owners, watershed workgroups, public and private organizations, county and local governments, and State and Federal agencies. It requires significant coordination with restoration efforts by other groups, such as CDFG, Category III of the Bay-Delta Agreement, the San Joaquin River Management Program, and the CALFED Bay-Delta Program. Since 1995, the AFRP has helped implement over 195 projects to restore natural production of anadromous fish, including fish screen upgrades for Sacramento's Water Facility Expansion Project, and ABFSHIP.

Long-Term Contract Renewal

In accordance with CVPIA Section 3404c, Reclamation is renegotiating long-term water service contracts. As many as 113 CVP water service contracts located within the Central Valley of California may be renewed during this process. Reclamation issued a Notice of Intent (NOI) for long-term contract renewal in October 1998. Environmental documentation was prepared on a regional basis. In February 2005, Reclamation has issued decisions (a ROD or Finding of No Significant Impact (FONSI)) for renewing contracts of the Sacramento River, San Luis, and Delta-Mendota Canal divisions, the Sacramento River Settlement Contracts, and several individual contracts. Preparation of environmental documents for other divisions and contracts are ongoing.

Reclamation has completed a draft EIS for renewing contracts within the American River Division, which includes the Folsom Unit, Sly Park Unit, and Auburn-Folsom South Unit of the CVP. The proposed contracts are for delivery of up to about 330,000 AF per year of CVP water for M&I uses for an additional 40 years for the El Dorado Irrigation District, EBMUD, PCWA, Roseville, Sacramento Municipal Utility District (SMUD), Sacramento County Water Agency (SCWA), and SJWD. This EIS and its associated ROD are required to execute CVP water service contracts with PCWA (35,000 AF per year) and Roseville (32,000 AF per year).

CALFED Bay-Delta Program

The mission of the CALFED Bay-Delta Program is to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta System. CALFED's four primary objectives are to (1) provide good water quality for all beneficial uses, (2) improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species, (3) reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system, and (4) reduce the risk to land use and associated economic activities, water supply, infrastructure, and the ecosystem from catastrophic breaching of Delta levees.

The California Bay-Delta Act of 2003 established the California Bay-Delta Authority (CBDA) as the new governance structure and charged it with providing accountability, ensuring balanced implementation, tracking and assessing program progress, using sound science, assuring public involvement and outreach, and coordinating and integrating related government programs. The CBDA oversees the Federal and State agencies working cooperatively through the CALFED Bay-Delta Program, including the following:

- **Federal agencies**. Reclamation, USFWS, United States Geological Survey (USGS), Bureau of Land Management, United States Environmental Protection Agency (EPA), USACE, Department of Agriculture, Natural Resources Conservation Service, United States Forest Service, NOAA Fisheries, and the Western Area Power Administration.

- **State agencies**. CBDA, California State Parks, DWR, CDFG, the Reclamation Board, Delta Protection Commission, Department of Conservation, San Francisco Bay Conservation and Development Commission, California Environmental Protection Agency (CEPA), SWRCB, DHS, and Department of Food and Agriculture.

In 2004, Congress passed the Water Supply, Reliability, and Environmental Improvement Act, also known as the CALFED Bay-Delta Authorization Act, to formalize Federal participation in continued CALFED activities for implementing the CALFED ROD.

The SRWRS is not a CALFED project and thus, is not subject to the ASIP process. However, coordination with CALFED efforts is required in identifying alternatives to reduce potential water supply impacts, as stated in the SRWRS authorization.

1994 Bay-Delta Accord and SWRCB Decision-1641

To provide ecosystem protection for the Bay-Delta Estuary, representatives of the Federal and State governments and urban, agricultural, and environmental interests entered into "Principles for Agreement on Bay-Delta Standards between the State of California and the Federal Government" in December 1994 to implement a Bay-Delta protection plan through the SWRCB. Subsequently in 1995, the SWRCB issued a draft Water Quality Control Plan (WQCP) for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. The draft WQCP specified revised flow and water quality standards in the Delta and regulated CVP and SWP operations potentially affecting the Delta. The EIR, which was completed in 1999, concluded that implementing the draft WQCP would have unavoidable impacts on water supply.

The SRWCB issued D-1641 in December 1999, and later revised it in March 2000 to amend certain terms and conditions of the water rights of the CVP and SWP. This decision requires that the CVP and SWP be responsible for meeting Delta water quality flow and salinity objectives for fish and wildlife protection, M&I water quality, agricultural water quality, and Suisun Marsh salinity, as specified in the WQCP, until a settlement was reached with other Sacramento Valley water right holders (this settlement process is also known as the "Phase 8 Proceedings"). SWRCB D-1641 also authorizes the CVP and SWP to jointly use each other's point of diversion in the southern Delta, with conditional limitations and required response coordination plans.

Under D-1641, the CVP and SWP often make additional releases from storage for meeting water quality objectives in the Delta. For the CVP, operating Folsom Reservoir to meet Delta water quality objectives is considered more efficient and effective because it is closer (i.e., shorter travel time) and the water quality of the American River is often better than that of the Sacramento River.

CALFED Programmatic Record of Decision

Following the issuance of a CALFED PEIS/EIR in July 2000, the CALFED agencies issued a programmatic ROD in August 2000 that identified 12 action plans, including plans for Governance, Ecosystem Restoration, Watersheds, Water Supply Reliability, Storage, Conveyance, EWA, Water Use Efficiency, Water Quality, Water Transfer, Levees, and Science Programs. The CALFED agencies then began implementing Stage 1 of the ROD, including the first 7 years of a 30-year program for establishing a foundation for long-term actions.

Storage Investigations

The CALFED ROD describes additional water storage as an important activity for improving water quality and water supply reliability for California. Through the ROD Storage Program, both surface water and groundwater storage projects in the Central Valley will be developed as part of an overall water management strategy. Groundwater and surface water storage may be used to improve water supply reliability, provide water for the environment at times when it is needed most, provide flows timed to maintain water quality,

and protect levees through coordinated operation with existing flood control reservoirs. As part of Stage 1 implementation of the ROD, the following investigations are underway:

- **In-Delta Storage Program.** In-Delta storage would help meet ecosystem needs of the Delta, EWA, and CVPIA; provide water for use within the Delta; and increase reliability, operational flexibility, and water availability for south-of-Delta CVP and SWP contractors. Lease/purchase of the proposed Delta Wetlands Project and potential for a new storage project are being explored.

- **Shasta Lake Water Resources Investigation.** This investigation explores an expansion of the dam and reservoir to help increase the pool of cold water available to maintain water temperatures in the lower Sacramento River needed for certain fish, and to provide other water management benefits such as water supply reliability.

- **Los Vaqueros Reservoir Expansion Studies.** These studies examine expanding the existing Los Vaqueros Reservoir with local partners as part of an initiative to provide water quality and water supply reliability benefits to Bay Area water users.

- **North of the Delta Offstream Storage.** The feasibility of a new offstream storage facility is being evaluated. This new north-of-Delta reservoir would enhance water management flexibility in the Sacramento Valley, and provide fisheries, water quality, and EWA benefits.

- **Upper San Joaquin River Basin Storage Investigation.** This investigation evaluates a range of approaches to increase water supplies, including enlarging Millerton Lake at Friant Dam or developing a functionally equivalent storage program. This storage would help restore and improve water quality of the San Joaquin River, and facilitate conjunctive water management and water exchanges that would improve the quality of water deliveries to urban communities.

These storage programs could have significant effects on water management of the CVP/SWP system. Study development for these storage programs and associated environmental documentation will continue through 2007.

Common Assumptions

DWR is working with Reclamation and other CALFED storage and supply project teams to develop Common Assumptions for CALSIM II Benchmark Studies. Developing Common Assumptions is an effort to establish common baseline conditions for feasibility studies for various CALFED water storage and water supply projects. Baseline conditions include existing conditions (2001) for compliance with CEQA, future conditions (2030) for compliance with NEPA, and CALFED alternative future conditions (2030), which are built on the NEPA baseline with additional assumptions for implementing nonstructural measures specified in the CALFED ROD.

Due to the dominant role of CALFED projects in the current water management landscape, it is anticipated that the CALFED Common Assumptions, once completed, would be used by non-CALFED studies and projects.

Sacramento Valley Water Management Program

The SVWMP is a collaborative effort to increase water supplies for farms, cities, and the environment by responding to water rights issues associated with implementation of the WQCP.

Since 1996, the SWRCB has engaged in proceedings to determine responsibility for meeting water quality standards in the Delta. The SWRCB has completed Phases 1 through 7 of these proceedings, leading to the issuance of D-1641, and continues to focus on Phase 8 involving water right holders on the Sacramento

River and its tributaries. Through the SVWMP efforts, a Short-Term Settlement Agreement[10] was executed in December 2002 by more than 40 water suppliers in the Sacramento Valley (Upstream Water Users), Reclamation, DWR, USFWS, CDFG, Contra-Costa Water District, and SWP contractors representing agricultural and municipal water users in Southern California, the central coast, and the San Joaquin Valley. Execution of this agreement resulted in the SWRCB automatically dismissing the Phase 8 process on January 31, 2003.

This Short-Term Settlement Agreement includes stipulations regarding implementing a series of short-term projects (up to 10 years after implementation) to meet unmet demands in the Sacramento Valley, and to provide at least 92,500 AF and up to 185,000 AF of water to augment CVP and SWP water supplies during certain year types. These projects would be owned and operated by the Upstream Water Users.

Reclamation and DWR issued an NOI and NOP, respectively, in August 2003 to prepare a PEIS/EIR to analyze the potential effects of implementing five categories of short-term projects: water management, reservoir reoperation, system improvements, surface and groundwater planning, and other nonstructural actions such as water transfers. PCWA is a signatory of the Short-Term Settlement Agreement, and reoperation of its MFP is one of the short-term projects included in the PEIS/EIR evaluation. Coordination with the SVWMP also could provide opportunities to identify alternatives to reduce water supply impacts to Sacramento Valley water users, if any, to insignificance to satisfy requirements in the SRWRS study authorization.

[10] The complete title of the Short-Term Settlement Agreement is "Short-Term Agreement to Guide Implementation of Short-Term Water management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assist in Meeting the requirements f the 1995 Water Quality Control Plan and to resolve Phase 8 Issues."

CHAPTER 3. WITHOUT-PROJECT CONDITIONS

This chapter briefly describes current and projected future without-project conditions. The magnitude of change between existing and future without-project conditions influences the scope of, and subsequent actions formulated in, the SRWRS.

EXISTING CONDITIONS

The Sacramento River, whose headwaters are controlled by Shasta Dam, is the largest river system in California. Major tributaries to the Sacramento River include the American and Feather rivers. These three rivers provide many recreational, agricultural, and environmental resources within the study area. **Figure 3-1** shows the location of the study area and vicinity in the Sacramento River watershed, including major rivers, areas, and facilities. **Table 3-1** summarizes major reservoirs shown in **Figure 3-1**.

Flow Conditions

The annual average Sacramento River flow at Verona (upstream of the confluence with the American River) is about 13.93 million AF per year, based on the 1930-2000 record maintained by the USGS (Station No. 11425500). The Sacramento River is the primary water source for the CVP, which operates major storages in upper basins, including Shasta Reservoir (4,552,000 AF, in the Sacramento River basin), Whiskeytown Lake (241,100 AF, in the Trinity River basin), and Black Butte Reservoir (143,700 AF, in the Stony Creek River basin).

Shasta Dam and Lake

The Feather River, with a drainage area of 5,921 square miles, is the largest tributary of the Sacramento River below Shasta Dam, contributing about 44 percent of the annual flow in the Sacramento River. The Feather River flows into the Sacramento River near Verona. Two major tributaries of the Feather River are the Yuba River and the Bear River, contributing on average about 30 percent of total Feather River flow.

The largest storage facility in the Feather River watershed is Lake Oroville with a capacity of 3,537,600 AF. The reservoir is owned and operated by DWR. Other major reservoirs include New Bullards Bar Reservoir on the North Yuba River (969,600 AF, owned and operated by Yuba County Water Agency (YCWA)), and Lake Almanor on the North Fork Feather River (1,308,000 AF, owned and operated by Pacific Gas and Electric Company (PG&E)). Through PG&E's Drum-Spaulding Project, PCWA receives water diverted from the Yuba and Bear rivers. Reclamation does not own or operate any major water supply facilities in the Feather River watershed.

The American River is another major tributary to the Sacramento River. The American River basin encompasses about 1,936 square miles and ranges in elevation from 23 feet to more than 10,000 feet above mean sea level (msl). The average annual flow of the American River at Fair Oaks (USGS Station No. 11446500) has been approximately 2.7 million AF per year from 1905 through 2003. It contributes about 15 percent of total Sacramento River flow below the confluence at Sacramento. The largest reservoir in the basin, Folsom Reservoir (975,000 AF), is owned and operated by Reclamation for the CVP. Other major reservoirs include the Union Valley Reservoir on Silver Creek (230,000 AF, owned and operated by SMUD), PCWA's Hell Hole Reservoir on the Rubicon River (208,400 AF), and French Meadows Reservoir behind the L.L. Anderson Dam on the Middle Fork American River (111,300 AF).

Figure 3-1. SRWRS Study Area and Vicinity Map

Table 3-1. Major Reservoirs Within the Study Area and Vicinity

Reservoir (Dam)	River	Owner[1]	Capacity (AF)	DOB[2]	Purposes (Uses of Water)
Black Butte	Stony Creek	USACE	143,700	1963	Flood Management, Storage (irrigation, recreation)
Folsom	American	Reclamation	975,000	1956	Multipurpose (hydropower, irrigation, recreation)
French Meadows (L.L. Anderson)	Middle Fork American	PCWA	111,300	1965	Diversion, Storage (domestic, irrigation, municipal, recreation)
Hell Hole	Rubicon	PCWA	208,400	1966	Diversion, Storage (domestic, hydropower, irrigation, recreation)
Lake Almanor (Canyon)	North Fork Feather	PG&E	1,308,000	1927	Diversion, Storage (hydropower, irrigation)
New Bullards Bar	North Yuba	YCWA	969,600	1970	Multipurpose (domestic, hydropower, irrigation, municipal, recreation, flood management)
Oroville	Feather	DWR	3,537,600	1968	Multipurpose (hydropower, irrigation, municipal, recreation, flood management)
Shasta	Sacramento	Reclamation	4,552,000	1945	Multipurpose (irrigation, hydropower, municipal, recreation, flood management)
Union Valley	Silver Creek	SMUD	230,000	1963	Storage (hydropower, recreation)
Whiskeytown	Clear Creek	Reclamation	241,100	1963	Multipurpose (hydropower, irrigation, municipal)

[1] Reservoir Owners:
DWR California Department of Water Resources
PCWA Placer County Water Agency
PG&E Pacific Gas and Electric Company
Reclamation Bureau of Reclamation
SMUD Sacramento Municipal Utility District
USACE United States Army Corps of Engineers
YCWA Yuba County Water Agency

[2] DOB: Completion date of dam and beginning of operation.

Below its confluence with the American River at Sacramento, the Sacramento River continues to flow down to the Delta, where it merges with the San Joaquin River, and then flows through San Francisco Bay to the Pacific Ocean. About 62 percent of total Delta inflow is from the Sacramento River, including additional CVP and SWP releases under the WQCP. Both the CVP and SWP export water to the San Joaquin Valley and Southern California through the Tracy and Banks pumping plants located in the south Delta.

Water Quality

Surface water quality is a function of the mass balance of water quality from tributary streams, diversions, agricultural return flows, subsurface drainage flows, permitted discharges from M&I sources, and urban runoff. While suitable for drinking water purposes, the Sacramento River, below Shasta Lake to its confluence with the American River, experiences variable water quality conditions largely influenced by flow conditions, temperature, agricultural runoff, and mine drainage from the Iron Mountain area. From the

confluence with the American River to the Delta, water quality varies due to urban runoff, the amount of flow from the American River, and agricultural runoff.

Feather River water quality generally degrades as water moves downstream from Lake Oroville to its confluence with the Sacramento River as a result of agricultural drainage, particularly from the Sutter Bypass. The quality of water in the American River is generally high from the river's headwaters to its confluence with the Sacramento River.

Fisheries

More than 30 species of fish are known to use the Central Valley portion of the Sacramento River, which extends from Keswick Dam to the Delta. The upper section of the Sacramento River, between Keswick Dam and Princeton, is of primary importance to native anadromous species, and is presently used for spawning and early life-stage rearing, to some degree, by steelhead, green sturgeon, and all four runs of Chinook salmon (i.e., fall, late-fall, winter, and spring runs). Consequently, various life stages of steelhead, green sturgeon, and all four runs of Chinook salmon can be found in the upper Sacramento River throughout the year.

The lower portion of the Sacramento River extends from Princeton to the Delta, and includes the confluences of both the Feather and American rivers. The lower Sacramento River is predominantly channelized, leveed, and bordered by agricultural lands. Aquatic habitat in the lower Sacramento River is characterized primarily by slow-water glides and pools; is depositional in nature; and has reduced water clarity and habitat diversity relative to the upper Sacramento River. This section of the river has no spawning habitat for salmonids, but serves as a migratory corridor for (1) fish that spawn in the upper Sacramento River and its tributaries, (2) anadromous fish that spawn in the Feather River and American River basins, and (3) fish emigrating to the Delta. Striped bass and American shad, two nonnative anadromous species, spawn in the lower Sacramento River. Other special status-species occurring in the Sacramento River include Sacramento splittail, Delta smelt, and hardhead.

The Feather River and its tributaries are spawning grounds for several special-status anadromous species, including fall-run and spring-run Chinook salmon, steelhead trout, Sacramento splittail, and green sturgeon. Striped bass and American shad, two nonnative anadromous species, also spawn in the Feather River. Fall- and spring-run Chinook salmon, steelhead, and shad also spawn in the Yuba River, a major tributary of the Feather River.

Folsom Dam and Lake

Folsom Lake and Lake Natoma on the American River support a great diversity of fish species, many of which were introduced. Strong thermal stratification occurs within Folsom Reservoir annually between April and November. Thermal stratification establishes a warm surface water layer and a deeper coldwater layer near the bottom of the reservoir. As a result, the reservoir supports both warmwater and coldwater fisheries. Coldwater releases from the lower elevations in Folsom Reservoir sustain coldwater fisheries in Lake Natoma and help maintain water temperature in the lower American River.

The lower American River below Nimbus Dam is used by over 43 species of fish, including numerous resident native and introduced species, and several anadromous species such as fall-run Chinook salmon, steelhead, Sacramento splittail, striped bass, and American shad. This stretch of the river extends 23 miles. The lower American River provides several types of aquatic habitat, including shallow habitat, fast-water riffles, glides, runs, pools, and off-channel backwater.

Seasonal releases from Folsom Lake's coldwater pool provide thermal conditions in the lower American River that support annual in-river production of anadromous salmonid species. Folsom Reservoir's annual coldwater pool volume is not sufficiently large to facilitate coldwater releases from July through September to provide maximum thermal benefits to juvenile steelhead rearing in the lower American River over the summer, and coldwater releases from October and November to benefit fall-run Chinook salmon migration, spawning, and incubation. Consequently, optimal management of the reservoir's coldwater pool on an annual basis is essential to provide the most favorable thermal benefits to both steelhead and fall-run Chinook salmon within the constraints of annual coldwater pool availability.

The Delta and San Francisco Bay together comprise the largest estuary on the West Coast. Over 120 fish species inhabit this estuary during at least a portion of their life cycles. Delta species include many anadromous species, and freshwater, brackish water, and saltwater species. Special-status species of the Delta include all four Chinook salmon runs, steelhead trout, sturgeon, Delta smelt, Sacramento splittail, and longfin smelt. Other species of primary management concern include American shad and striped bass. The Delta is a primary habitat for striped bass, Sacramento splittail, sturgeon, Delta smelt, and longfin smelt.

Fish weir at Nimbus Fish Hatchery

Vegetation and Wildlife

The vegetation of the Sacramento River system supports a diversity of terrestrial wildlife species and reflects the Great Valley and Sierra Nevada foothill bioregions of California. Plant community composition within these regions includes riparian, grassland, oak woodland, chaparral, conifer forest, and emergent wetland vegetation types. These terrestrial habitats provide seasonal and year-round habitat for many species of native and introduced wildlife. The following description is an overview of the vegetation and wildlife associated with the Sacramento River, its two major tributaries (the Feather and American rivers), and the NCC.

The Sacramento River supports some riparian vegetation; however, it is limited to narrow bands between the river and the riverside of the levee. Riparian vegetation on the Sacramento River is not as diverse as on the American River. The Sacramento River riparian community consists of valley oak, cottonwood, wild grape, box elder, elderberry, and willow. The shores of the lower Sacramento River are characterized by agricultural use.

Vegetation in the Feather River watershed is diverse, ranging from mixed conifer and deciduous forest to sparse ponderosa pine plant communities. Long-term vegetation disturbance and consequent gully erosion have led to dramatic changes in the hydrology of the Feather River and its tributaries, resulting in reduced summer flow, higher summer water temperatures, lower water tables, reduced meadow storage capacity, and a trend from perennial to intermittent flow. Many down-cut streams no longer sustain late-season flow, causing adverse consequences to riparian and upland vegetation, aquatic communities, and downstream water users.

The NCC joins the Sacramento River downstream from the mouth of the Feather River and upstream from the American River. This channel supports a dense riparian association of black willow, shining willow, and cottonwood. Riparian cover within the channel provides nesting, thermal, and escape covers for local wildlife populations. The channel also serves as a wildlife movement corridor for wildlife accessing the Sacramento River.

Numerous species existing throughout Sacramento County are state-listed or federally listed as threatened or endangered or are candidates for listing under the Federal ESA. Sensitive plant species potentially occurring

in the area include Sanford's arrowhead and Sacramento Orcutt grass. Sensitive wildlife species include Swainson's hawk, valley elderberry longhorn beetle, bank swallow, and giant garter snake. In addition, Sacramento County contains numerous vernal pools, some of which may be inhabited by the Federally listed vernal pool tadpole shrimp and fairy shrimp, and several sensitive plant species.

Riparian zone along the Feather River

Throughout the Sacramento River basin, native species have declined due to introduction of invasive nonnative species of plants and wildlife. Native riparian vegetation has been replaced with introduced tamarix, giant reed, and tree-of-heaven. Populations of nonnative species, including red fox, bullfrog, and brown-headed cowbird, have reduced native wildlife populations.

Land Use/Recreation

Sacramento County includes extensive areas of both urban and agricultural uses. The Sacramento metropolitan area is one of the fastest growing urban regions in California. The county's 1990 population is nearly 4 times that of the 1950 population and 97 percent of the population in the SRWRS study area is considered urban. Sacramento's statewide role, the prevalence of outdoor recreation opportunities, and the availability of land have contributed to this growth and are likely to continue to be a draw for future urbanization. The southern and southeastern portions of Sacramento County are dominated by a variety of agricultural uses, including croplands and rural residential land use.

Placer County also has experienced significant growth since 1950. The southern portion of the county has become increasingly urbanized with the influx of industry and new residential development into the Roseville-Rocklin area in the 1980s. Roseville, the largest city in this part of the county, grew fivefold in the past 40-year period. Continuation of urban growth in the county is accounted for in local General Plans.

Beach area at Beals Point in Folsom Lake State Recreation Area

Sutter County, which also has experienced consistent growth, has not grown as fast as Sacramento and Placer counties. The southwestern corner of Sutter County is dominated by agricultural use, mainly tree and field crops (rice in particular). The area is sparsely populated (20- to 80-acre parcel minimums) and has no incorporated or urban areas.

The Sacramento River, Feather River, and American River (including Folsom Lake and Lake Natoma) provide extensive water-related recreation opportunities. The tributaries of the American River are heavily used for whitewater rafting. Downstream, the 18,000-acre Folsom Lake and recreation area offers opportunities for fishing, hiking, biking, swimming, running, camping, picnicking, horseback riding, water skiing, and boating.

Folsom Lake is entirely within Folsom Lake State Recreation Area (SRA), administered by the California Department of Parks and Recreation. Folsom Lake SRA is one of the most popular recreation areas in the state with average annual visits of nearly 2.6 million. Predominant recreational uses are water-related, such as boating and water skiing. Downstream of Folsom Dam, Lake Natoma, the Folsom Dam afterbay, is also a unit of Folsom Lake SRA. Developed recreation facilities include picnic areas, bicycle and pedestrian trails,

boat launch ramps, and campgrounds. On average, the lake supports about 500,000 visitor use days per year; the predominant recreational activity is trail use.

The lower American River, from Nimbus Dam to its confluence with the Sacramento River, is designated as recreational river by both the Federal and State governments under the National and State Wild and Scenic Rivers acts, respectively. Under the National Wild and Scenic Rivers Act (PL 90-542, 16 USC 1271 *et seq*.), Federally assisted projects affecting the lower American River are subject to the Secretary of the Interior's determination that the projects "will not … unreasonably diminish" the river's recreational value. The State act restricts construction of diversions unless the Secretary of the California Environmental and Natural Resources Agencies determines that construction is needed to supply domestic water to residents of the county and will not adversely affect the natural character of the river.

In addition, approximately 29 miles of the lower American River from Folsom Dam to its confluence with the Sacramento River are included in the American River Parkway Plan, an element of the Sacramento County General Plan. The American River Parkway (Parkway) consists of 14 interconnected parks and a continuous trail system, encompassing approximately 5,000 acres. The County of Sacramento estimated that more than 5 million visitors per year use the Parkway and the Parkway's Jedediah Smith Memorial Trail.

There are many recreation opportunities on the Sacramento River from its confluence with the Feather River downstream to Courtland, including boating, fishing, canoeing, rafting, swimming, and picnicking. Fishing is one of the biggest uses of the Sacramento River. Several boat launching and regional park facilities are located along the Sacramento River. The Sacramento River from the Feather River to Cache Slough Junction, a few miles upstream from Rio Vista, is one of the more popular sections for boating. The several-thousand-acre Stone Lakes National Wildlife Refuge is located within this southern portion of Sacramento County, east of the Sacramento River, and provides hiking and wildlife viewing opportunities.

The Feather River supports extensive water-related recreation activities at Feather River Canyon, upstream and northeast from the river's confluence with the Sacramento River. Several marinas, boat ramps, and river parks are located near the confluence of the Sacramento and Feather rivers.

Aesthetics

The Sacramento River segment with the richest visual variety extends from Keswick Dam downstream to Red Bluff. The segment below that, extending from Red Bluff to the confluence with the lower American River, is largely confined by levees and rock revetment bank protection. The latter segment has less visual variety and is considered less pristine in appearance than the upper section of the river. The lower Sacramento River, extending from its confluence with the lower American River downstream to the Delta, is not considered visually sensitive as it is now leveed and bordered by agricultural land.

The visual character of the Sacramento River south of Verona is typified by large expanses of flat agricultural lands divided by vegetated waterways and developed uses. Visual perceptions of the area are most easily characterized according to the viewer's location: views from the river, and views from the levee areas. Vistas from the river and from riverside residences are primarily short-range, due to the higher elevation of the adjacent levees. Foreground views from the water consist of levees, riparian vegetation, and occasional riverside residences and docks. From the levee adjoining the river, the surrounding area appears vast and open. Foreground views from the levee generally consist of roadside vegetation, orchards, and cultivated fields. Middle-ground and background views of roadways, agricultural lands, and developed uses tend to blend due to the area's overall flatness. The Sierra Nevada and Coast Range are visible to the east and west, respectively, on occasional clear days.

The Feather River segment near its confluence with the Sacramento River is located in an agricultural area in Sutter County. The terrain is generally flat, with little variation. The river channel is wide and contains turbid, slow-moving water. The river is visible from the Garden Highway, which is not heavily used, and views of the river are limited because of the surrounding flat topography.

American River downstream of the Nimbus Fish Hatchery

The lower American River is considered to exhibit high scenic quality. Visual characteristics of the lower American River consist of steep bluffs, terraces, islands, backwater areas, and riparian vegetation. The lower American River is divided into three visual components. The upper river visual component extends from Nimbus Dam downstream to the Gristmill Dam Recreation Area, consists of steep bluffs, terraces, riparian vegetation, and shallow water areas, and is considered the most visually sensitive area along the river. The middle visual component is not considered as diverse as the upper river and consists of moderately sloped embankments, riparian vegetation, and shallow water areas. The lower visual component is considered the least visually sensitive and is primarily gravel banks, riffles, and ponds.

Cultural Resources

Cultural resources include physical resources and intangible cultural values pertaining to paleontology, prehistoric and historic archaeology, history, and Native American ethnography. Paleontological resources include fossil animals and plants of scientific value. Archaeological resources include evidence of past human activities, both prehistoric and historic. Historic resources also include extant structures. Ethnographic resources may include natural or cultural resources, landscapes, or natural environmental features that are linked by a community, or group of communities, to the traditional practices, values, beliefs, history, and/or ethnic identity of that community or wider social group.

Several dozen prehistoric sites have been identified along the lower American, North Fork American, and lower Sacramento rivers. These include village sites, bedrock milling stations, lithic scatters, and small campsites. More than a hundred prehistoric sites have been identified within the Folsom Reservoir basin. Of particular concern are sites located within reservoir inundation areas. Such sites are subject to degradation due to reservoir siltation, erosion from fluctuating surface water elevations, and vandalism when exposed by low surface water elevations.

Historic sites along the lower American River, North Fork American River, and lower Sacramento River include placer mining districts, railroad-related structures, irrigation and hydroelectric facilities, and historic residential structures.

Ethnographic resources include historic Nisenan (southern Maidu) village sites located along the lower Sacramento, lower American, and North Fork American rivers. Many archaeological sites in the area contain burials, and human remains are of substantial concern to contemporary American Indian people. Several Federally recognized tribes are located within the SRWRS area. These include the United Auburn Indian Community of the Auburn Rancheria in Placer County and the Shingle Springs Band of Miwok Indians in El Dorado County. No Federally recognized tribes exist in Sacramento or Sutter counties. However, the State recognizes several other local groups of Native Americans.

Soils and Geology

Sacramento Valley soils are alluvial in nature and found in deep alluvial fans and floodplains. These soils are highly valued for irrigated crops. Soils found along the edges of the Central Valley include brown neutral

and red iron pan soils. Soils in Sacramento County have been significantly influenced by human activities for uses such as cultivation and urban development. Historically, gold dredging, hydraulic mining, drainage system development, creation of levees, and cut and fill all have contributed to modifying the original soils. Geologic formations underlying the foothills portion of the study area consist of complex folded and faulted, metamorphosed volcanic and sedimentary rocks that have been eroded to a landscape of moderate relief and thin soils.

Water Supply Conditions

Statewide sources of water supply, and water supply in the study area, are described in this section.

Statewide Water Supply Projects

The regional water supply in California is facilitated mainly through operations of the CVP and SWP to meet in-basin needs and provide exports for areas south of the Delta. In addition to water supplies provided by the CVP and SWP, groundwater resources within the Sacramento Valley and San Joaquin Valley provide significant water supplies to local agricultural and M&I water users. Numerous local and regional projects also provide surface water, groundwater, and other supplies. To be consistent with ongoing statewide water supply projects/studies and CALFED ROD implementation, water supply and demand conditions in 2001 are used as existing conditions.

In 2001, CVP deliveries totaled about 5.7 million AF, or about 80 percent of its total contracted deliveries of 7.1 million AF.[11] These deliveries included approximately 2.9 million AF to the Sacramento River Service Area, 192,000 AF to the American River Service Area, and 2.6 million AF to the Delta Export Service Area.

In 2001, SWP deliveries totaled approximately 1.6 million AF, or about 39 percent of the SWP's total contracted deliveries of 4.1 million AF.[12] These deliveries included 31,900 AF to contractors north of the Delta (e.g., Feather River and North Bay) and 1.6 million AF to contractors south of the Delta (e.g., South Bay, San Joaquin Valley, central coast, and Southern California contractors).

Water Supply in the Study Area

Water supply in the SRWRS study area is mainly from surface water diversions from the American and Sacramento rivers and groundwater extraction, although water supplies also are imported from other river basins through the Drum-Spaulding System, owned and operated by PG&E.

Surface Water Supply

Table 3-2 summarizes service areas in the study area by surface water diversion points on the American and Sacramento rivers. The current maximum of water rights/contract entitlements and existing surface water diversions of SRWRS cost-sharing partners is summarized in **Table 3-3**.

Groundwater Supply

The extent of the groundwater basin associated with the study area includes the northern Sacramento County and southern Placer County portions of California's Great Valley Physiographic Province. The groundwater

[11] CVP delivery data for 2001 from E-mail communication with Reclamation (January 2003).
[12] SWP delivery data for 2001 from DWR Web site (wwwswpao.water.ca.gov/water.html), Notice to Contractors Number 01-15.

Table 3-2. Existing Authorized Diversions and Service Areas Within the Study Area

Authorized Diversion Point	Service Area
Sacramento River	
Near Sacramento International Airport	Natomas Mutual Water Company
Near Discovery Park	City of Sacramento
Near Freeport	East Bay Municipal Utilities District
	Sacramento County Water Agency
American River	
Auburn Dam Site	Placer County Water Agency (MFP water rights)
Folsom Reservoir	City of Folsom
	City of Roseville
	El Dorado Irrigation District
	Folsom Prison
	Placer County Water Agency (MFP water rights and CVP entitlement)
	Sacramento Suburban Water District
	San Juan Water District (including Citrus Heights Water District, Orange Vale Water Company, Fair Oaks Water District, City of Folsom)
Folsom South Canal	Arden Cordova Water Service Company
	Clay Water District
	Galt Water District
	Mather Air Force Base
	Omochumne-Hartnell Water District
	Sacramento County Water Agency
	Sacramento Municipal Utilities District
Near Landis Avenue and Ancil Hoffman Park	Carmichael Water District
Near Arden Bar	Sacramento Suburban Water District
Above H Street Bridge to confluence	City of Sacramento

basin is part of the 400-mile-long regional Central Valley aquifer system extending from Red Bluff to Bakersfield.

Under historical natural conditions, groundwater flow underlying northern Sacramento County beneath the study area was westward from areas of recharge in the foothills toward areas of discharge near the Sacramento River. According to DWR,[13] groundwater levels were relatively stable between 1930 and 1940. Increased reliance on groundwater pumping since the 1940s has modified these conditions and groundwater levels have dropped an average of approximately 1 foot per year beneath parts of northern Sacramento County. Recent groundwater conditions (see **Figure 3-2**) are represented by fall 1998 groundwater level contours. Notable features include the following:

- Persistent groundwater cone of depression in the southern portion of the basin, along the Sacramento County/Placer County boundary

- Sacramento and American rivers acting as sources of recharge, as shown by the mounding of groundwater under and adjacent to the riverbeds

[13] DWR. 1974. Evaluation of Ground Water Resources: Sacramento County, Bulletin 118-3.

- East to west gradient resulting from recharge from the High Sierra

Historically, agricultural users in Placer County have used groundwater. PCWA has not used groundwater as an M&I supply due to restrictions in the existing Placer County General Plan. Roseville has sufficient surface water supplies to meet existing demands; thus, groundwater normally has not been used as a water supply. Until recently, SSWD has mostly relied on groundwater to meet its customers' needs. Since 2000, surface water also has been introduced by SSWD for in-lieu rechange in the PCWA-SSWD Groundwater Stabilization Project. Historically, Sacramento has used both groundwater and surface water to meet demands.

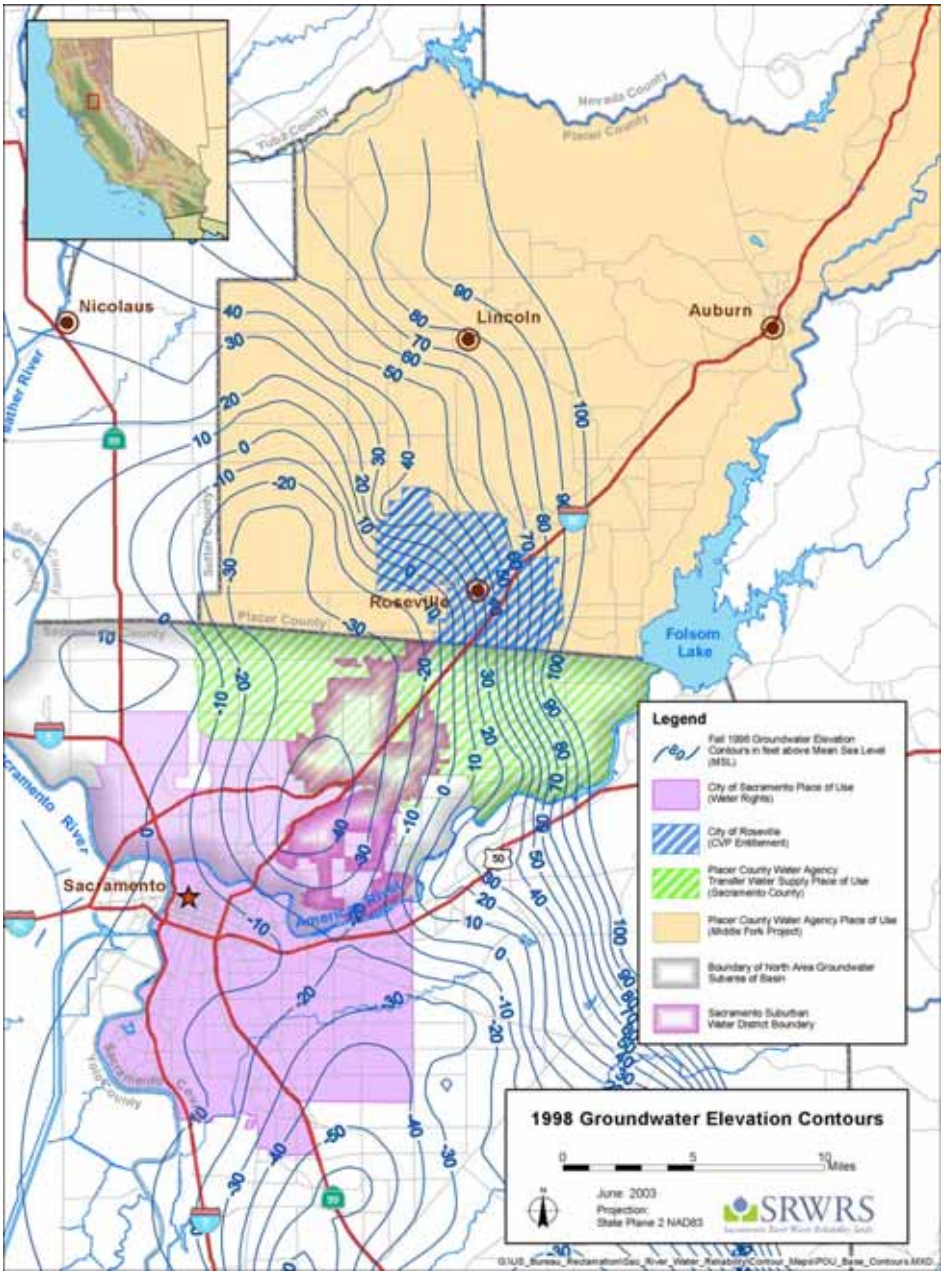


Figure 3-2. 1998 Groundwater Surface Elevations Within the SRWRS Study Area

Table 3-3. Existing Surface Water Use Compared with Available Water Rights and Contract Entitlements, by SRWRS Cost-Sharing Partner

Water Purveyor	Surface Water Sources	Currently Authorized Points of Diversion	Water Rights/ Contract Entitlements (AF per year)	Amount Contracted to Other Water Purveyors (AF per year)	Existing Diversion by Water Purveyor[1] (AF per year)
PCWA	MFP water rights	Auburn Dam Site, Folsom Dam	120,000	84,000[2]	13,000
	PG&E water supply contract	Drum-Spaulding Canal System	100,400		100,400
	CVP entitlement	Folsom Dam	35,000[3]		0
SSWD	PCWA water sale agreement	Folsom Dam	29,000		15,300
	Sacramento water delivery agreement	Fairbairn WTP	26,064		
Roseville	PCWA water sale agreement	Folsom Dam	30,000		35,600
	SJWD water transfer agreement		4,000[4]		
	CVP entitlement		32,000		
Sacramento	Water rights (American River)	Above H Street Bridge to confluence	245,000	28,644[5]	124,900
	Water rights (Sacramento River)	Near Discovery Park	81,800		

[1] Preliminary data provided by cost-sharing partners for 2001 and 2002; amounts are subject to revision. The amount of diversion does not include diversions of other purveyors based on water sale contracts and/or water delivery agreements.

[2] PCWA has water sale contracts with SJWD (up to 25,000 AF), Roseville (up to 30,000 AF), and SSWD (up to 29,000 AF).

[3] According to the currently negotiated PCWA Amendatory contract, which reduces PCWA's entitlement from 117,000 AF per year to 35,000 AF per year, and moves the authorized diversion point from the Auburn Dam site to Folsom Dam.

[4] The agreement provides for a 4,000 AF transfer amount only in years when March-through-November unimpaired inflow to Folsom Lake is above 950,000 AF.

[5] Sacramento has a 1964 agreement with SSWD (formerly Arcade Water District) for up to 26,064 AF of raw water delivery, and a water sale contract with Cal-American (up to 2,580 AF).

FUTURE WITHOUT-PROJECT CONDITIONS

The future without-project conditions include some of the expected physical, environmental, and socio-economic conditions generally expected to occur in the future in the study area. These conditions are used for planning purposes[14] at this stage of study development to assess the water supply options of each cost-sharing partner.

Physical Environment

Basic physical conditions in the Placer-Sacramento area are expected to remain relatively unchanged in the future. No changes to area topography, geology, or soils are foreseen. From a river geomorphic perspective, major rivers in the Sacramento River basin are regulated and thus, ongoing restoration efforts may have only localized effects. Without major changes to the river systems, which are unlikely, hydrologic conditions will probably remain unchanged. Discussions are occurring regarding potential changes in the region's hydrology due to global warming effects; scientific work in this field of study is continuing.

Biological Environment

Significant efforts are underway by numerous agencies and groups to restore various biological conditions throughout the study area. These efforts include elements of the CALFED programs, AFRP program, and Water Forum efforts. As population and urban growth continues and land uses are converted to urban centers, many wildlife species especially dependent on woodland, oak woodland, and grassland habitats may be affected. However, through the protection of relevant laws and significant efforts of Federal, State, and local agencies, populations of anadromous fish and special status species would be expected to generally remain as under existing conditions.

For environmental purposes, WFA signatories are individually or collectively currently implementing and/or developing several water management actions stipulated in the WFA:

- Reducing future diversions from the American River in dry years to maintain flows in the lower American River. Diversion limitations would be observed by individual water purveyor according to their WFA PSAs.

- Developing an FMS for the lower American River, which includes releasing supplemental flows from PCWA's MFP storage in dry years to augment flows in the lower American River. The FMS is currently under development by Reclamation, the Water Forum, and USFWS.

- Seeking diversions on the Sacramento River to reduce future diversions from the American River. The SRWRS is under development by Reclamation and the cost-sharing partners.

The first action imposes constraints on surface water supply to the Placer-Sacramento region, as explained later in this chapter. The other two actions require further federal decisions for implementation and thus, are not included in the future no-action conditions.

Social and Economic Environment

According to a March 2001 projection by the Sacramento Area Council of Governments (SACOG), the population of the Placer-Sacramento area would increase by about 700,000 between 1999 and 2025, which is about a 50 percent increase from the 1999 population level. Along with Reclamation, Sacramento and

[14] The basis of comparison for NEPA and CEQA compliance will be established later during EIS/EIR development.

PCWA are two major water rights holders in the American River basin. In addition to meeting their own water supply needs, water from the water rights of these two agencies has been contracted to local agencies to satisfy regional water supply needs.

Projected Demands

The General Plans of Sacramento County, Placer County, Sacramento, and Roseville have provisions for planned development and urbanization. Projected future demands were reported in the WFA analysis as the basis for its programmatic planning process. With a planning horizon through 2030, WFA analysis reflects the General Plans of Placer and Sacramento counties and incorporated cities. The WFA also incorporates a projected 25.6 percent of demand reduction due to implementation of best management practices (BMPs) for water conservation. These BMPs constitute major components of RWA's Water Efficiency Program (WEP) to improve water efficiency for urban conservation, which also speaks to the conservation goals of the California Urban Water Conservation Council, CVPIA, and CALFED Bay-Delta Program.

Projected demands for the cost-sharing partners are consistent with WFA assumptions, including updates from recent planning efforts such as PCWA's 2003 Water Supply Infrastructure Plan, Roseville's 2004 West Roseville Specific Plan, and the County of Sacramento's 2004 Zone 40 Master Plan. The following summarizes these projected 2030 demands, **Table 3-4** tabulates the demands by cost-sharing partner, and **Figures 3-3** through **3-6** show locations of planning areas identified in the table.

- **PCWA**. The estimated M&I demand is 85,400 AF per year, assuming a slow growth scenario under water shortage conditions. **Figure 3-3** shows the PCWA service area. PCWA is the only agency among the cost-sharing partners responsible for supplying water for agricultural purposes. PCWA plans to serve projected M&I demand with surface water in all hydrologic conditions, except during emergencies or for peaking during daily operation, to be consistent with provisions in the Placer County General Plan that limit groundwater use for urban development in unincorporated areas.

- **SSWD**. The estimated demand of 99,289 AF per year is for SSWD and its wholesale service area (see **Figure 3-4**). SSWD plans to serve the projected demand mainly by groundwater with supplemental surface water from PCWA and Sacramento per its corresponding water contracts.

- **Roseville.** The estimated demand of 64,020 AF per year is for Roseville (including the recent August 2004 annexation of the West Roseville Specific Plan area) and remaining 2,358 acres of unincorporated area in the Roseville/Placer County Memorandum of Understanding Area (MOU Area). The MOU Area is extends west to the current city limits; Roseville has the first right of refusal for its development. **Figure 3-5** shows Roseville city limits and the MOU area.

- **Sacramento.** The threat of groundwater contamination and concern over groundwater overdrafting have resulted in requests for surface water delivery from Sacramento on retail or wholesale bases. (The previously mentioned delivery to SSWD is in this category.) As a regional approach, the total treated water demand of Sacramento is 239,804 AF per year, and would be used for providing retail and wholesale services to areas within the city limits, Sacramento's water right permits POU, and existing commitments of groundwater wholesale to areas in the County of Sacramento (shown in **Figure 3-6)**. With the exception of areas outside its POU, Sacramento plans to use surface water for the above projected demands in all years, and reserve groundwater use for emergencies.

  Sacramento also has contracts with the County of Sacramento to wheel water for unincorporated areas such as Sacramento County Zone 40 south of the American River, and Zone 50 (Sacramento International Airport, and Metro Air Park) in the Natomas Basin. These commitments represent additional needs in facility capacity for diversion, treatment, and transmission, as shown in **Table 3-5**. Facility capacity needs are shown in maximum-day demand (max-day demand), the

estimated maximum daily use in a year, which is commonly presented in mgd and used as the design capacity for water supply facilities.

Table 3-4. Summary of Projected Future Demand by SRWRS Cost-Sharing Partner

SRWRS Cost-Sharing Partners and Service Areas	Projected Future Demand (AF per year)		
	Agricultural Use	M&I Use	Total
PCWA			
Zone 1 Canal Delivery Area (including foothill communities such as Auburn, Loomis, and Penryn, which have very limited or no groundwater accessibility)	70,000	0	70,000
Zone 1 Treated Water Delivery Area (area in Western Placer County, including incorporated cities of Lincoln and Rocklin)	0	85,400[1]	85,400
Zone 5 (Western Placer County near Sutter County line; PCWA provides up to 15,000 AF per year of supplemental water supply for agricultural use)	70,000[2]	0	70,000
PCWA Subtotal	**140,000**	**85,400**	**225,400**
SSWD			
SSWD (service areas of former water purveyors such as Northridge Water District, Arcade Water District, and McClellan Air Force Base)	0	48,373	48,373
SSWD Wholesale Area (Rio Linda/Elverta Community Water District, Cal-American Water Company (Antelope and Royal Oak/Lincoln Oaks), Del Paso Manor Water District, Sacramento County Water Agency (Arden Park Vista), and Southern California Water Company (Arden Town))	0	50,916	50,916
SSWD Subtotal	**0**	**99,289**	**99,289**
Roseville			
City Limits (including August 2004 annexation of West Roseville Specific Plan)	0	51,620	51,620
Remaining MOU Area (2,358 acres of unincorporated area in the Roseville/Placer County MOU Area, which extends west to the city limits, where Roseville has the first right of refusal for its development)	0	12,400	12,400
Roseville Subtotal	**0**	**64,020**	**64,020**
Sacramento			
City Limit and Pending Annexation Areas (including Freeport, Sacramento County Water Agency (Northgate), and Sacramento Municipal Utility District Cogeneration Facility)	0	161,974	161,974
Area D, Outside City Limits (including a portion of SSWD, Cal-American (Arden), Del Paso Manor Water District, Southern California Water Company (Arden Town), and Sacramento County Water Agency (Arden Park Vista))[3]	0	30,222	30,222
Remaining POU Area (a portion of Cal-American (Rosemount and Countryside), Florin County Water District, Unincorporated Area (Zone 40), Fruitridge Vista Water Company, and Tokay Park Water District)	0	40,472	40,472
Areas Outside POU, South (Sacramento Regional County Sanitation District Wastewater Treatment Plant)	0	520	520
Areas Outside POU, North (Sacramento International Airport, and Metro Air Park (Zone 50)) [4]	0	6,616	6,616
Sacramento Subtotal	**0**	**239,804**	**239,804**
Cost-Sharing Partners' Total[3]	**140,000**	**481,451**	**621,451**

[1] PCWA's M&I demand was based on the slow growth scenario in the PCWA Water Supply Infrastructure Plan (MWH, 2003).
[2] Per Placer County's request, PCWA committed to provide up to 15,000 AF per year of surface water to supplement a total agricultural demand of around 70,000 AF per year.
[3] Area D is defined in Sacramento's water right permits. A portion of Area D is within city limits, and the remaining area is within either the SSWD service area or its wholesale area. The "Cost-Sharing Partners' Total" excludes the overlapping demands.
[4] Sacramento would provide groundwater wholesale service to Zone 50 as an interim measure before the County of Sacramento could provide a permanent source of water wheeling through Sacramento's facility for use in this area.

Table 3-5. Summary of Projected Capacity Needs for Sacramento

Retail and Wholesale Service Areas of Sacramento*	Water Supply Demand (AF per year)	Capacity Need (mgd)			
		By Function		By Source	
		Max-Day Demand	Wheeling Request	Surface Water	Groundwater
City Limits	161,974	259		259	
Area D, Outside City Limits	30,222	50		50	
Other POUs	40,472	69		69	
Outside POU, South	520	1			1
Outside POU, North[1]	6,616	12			12[1]
Sacramento County Zone 40			11	11	
Sacramento County Zone 50[1]			12	12[1]	
Total	**239,804**	**391**	**23**	**401**	**13**

* Based on categories in Table 3-4.

[1] Sacramento would provide groundwater wholesale service to Zone 50 as an interim measure before the County of Sacramento could provide a permanent source of water wheeling through Sacramento's facility for use in this area.

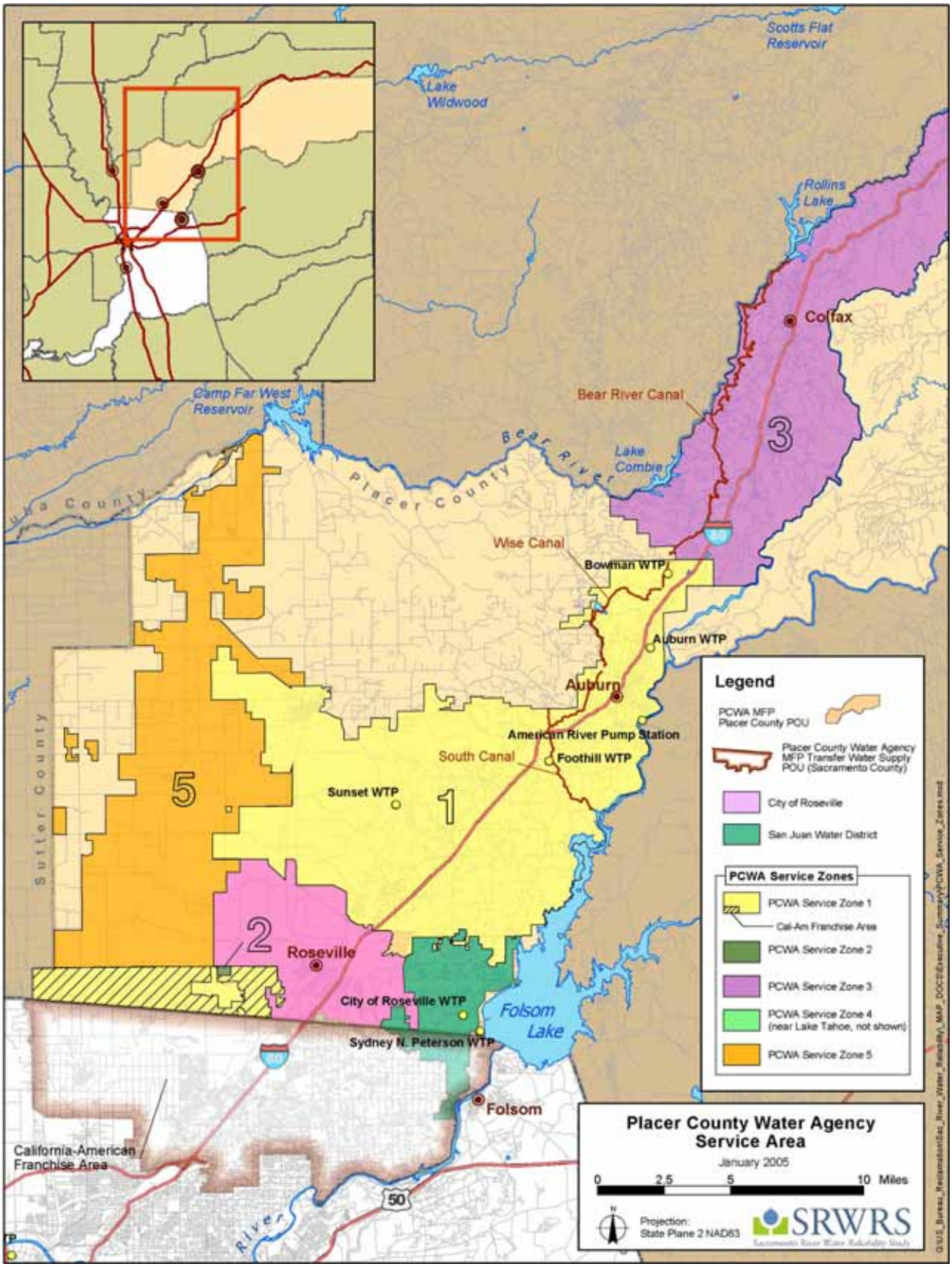


Figure 3-3. PCWA Service Areas

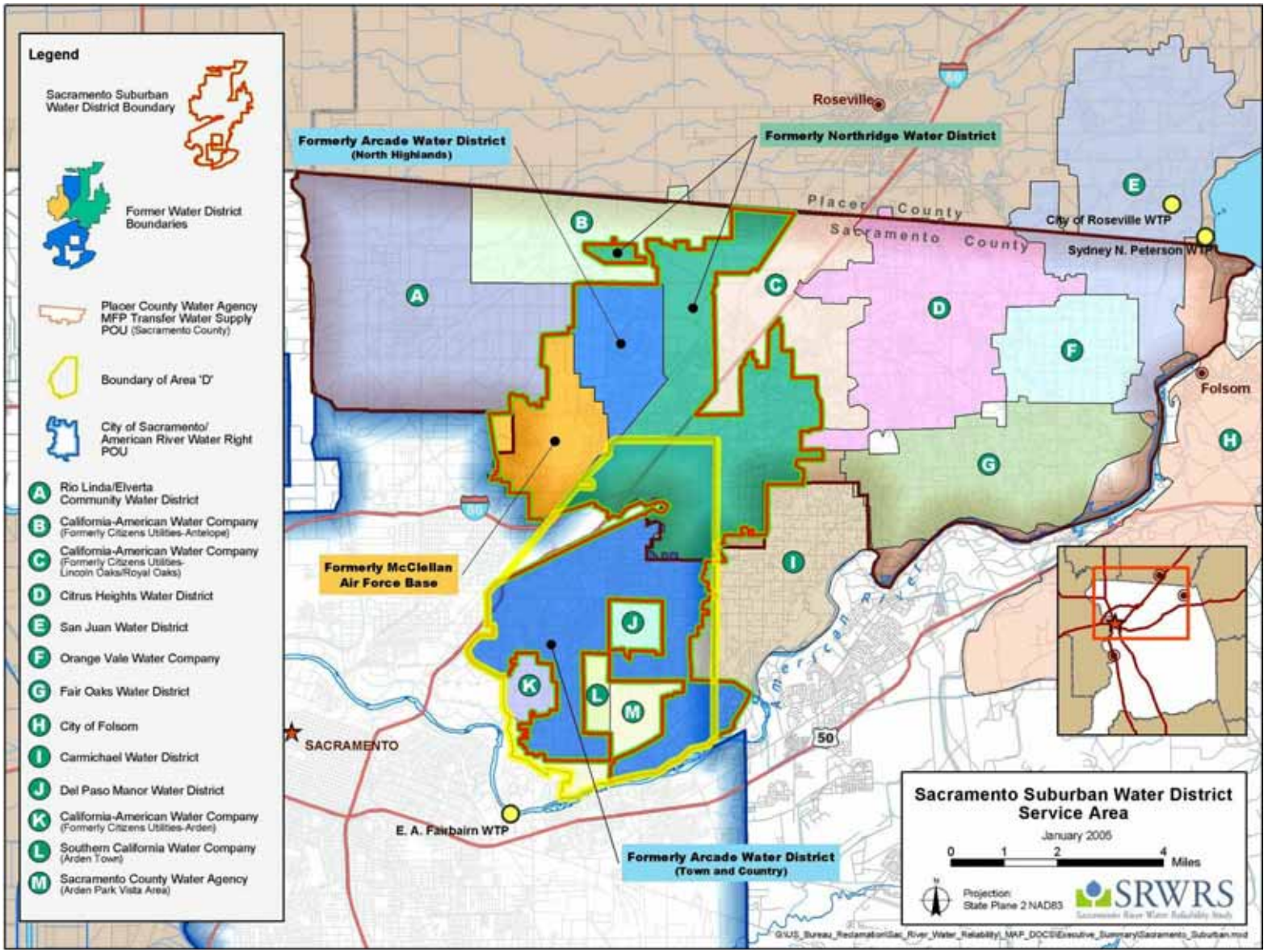


Figure 3-4. SSWD Service Areas

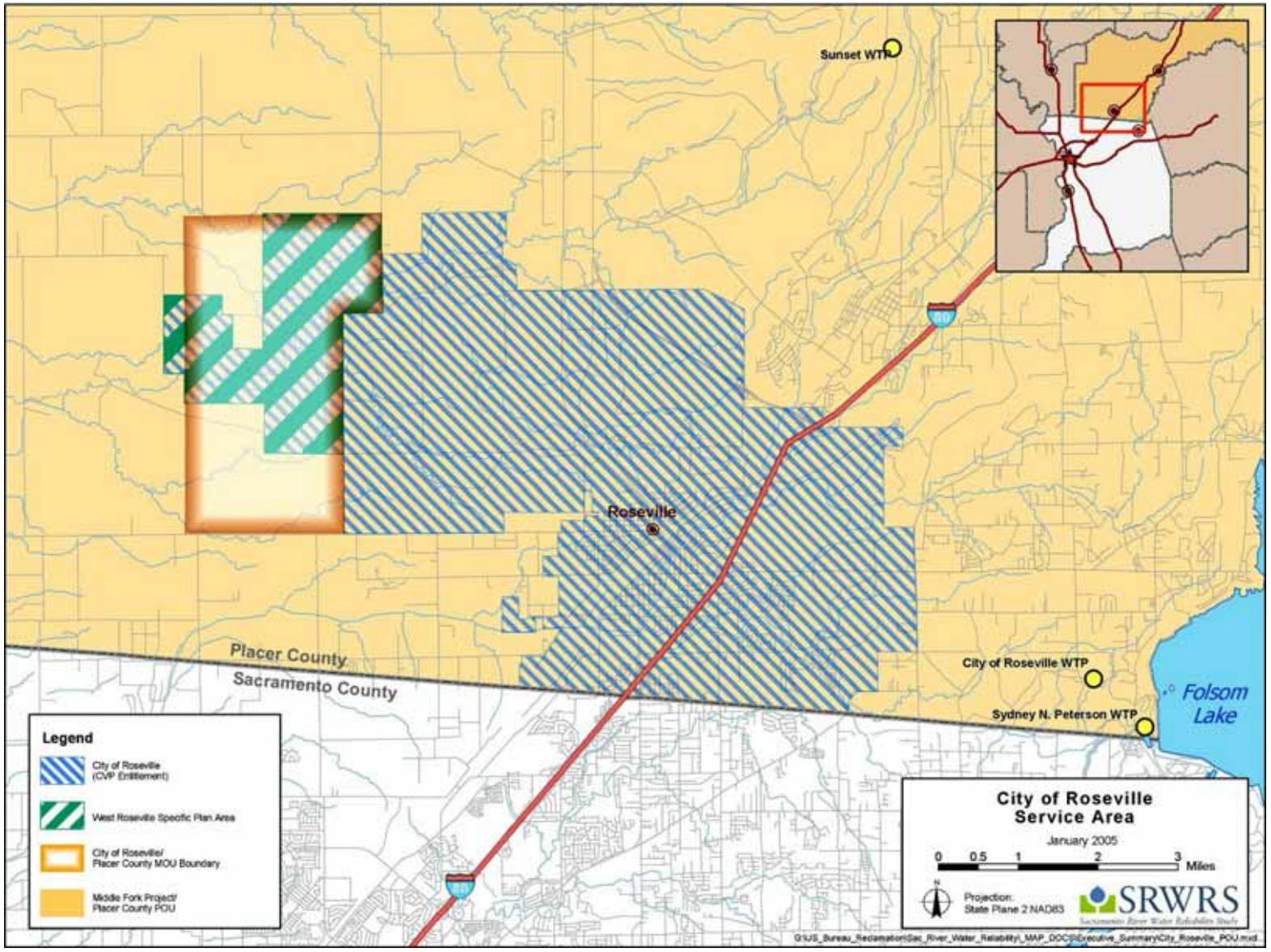


Figure 3-5. Roseville Service Areas

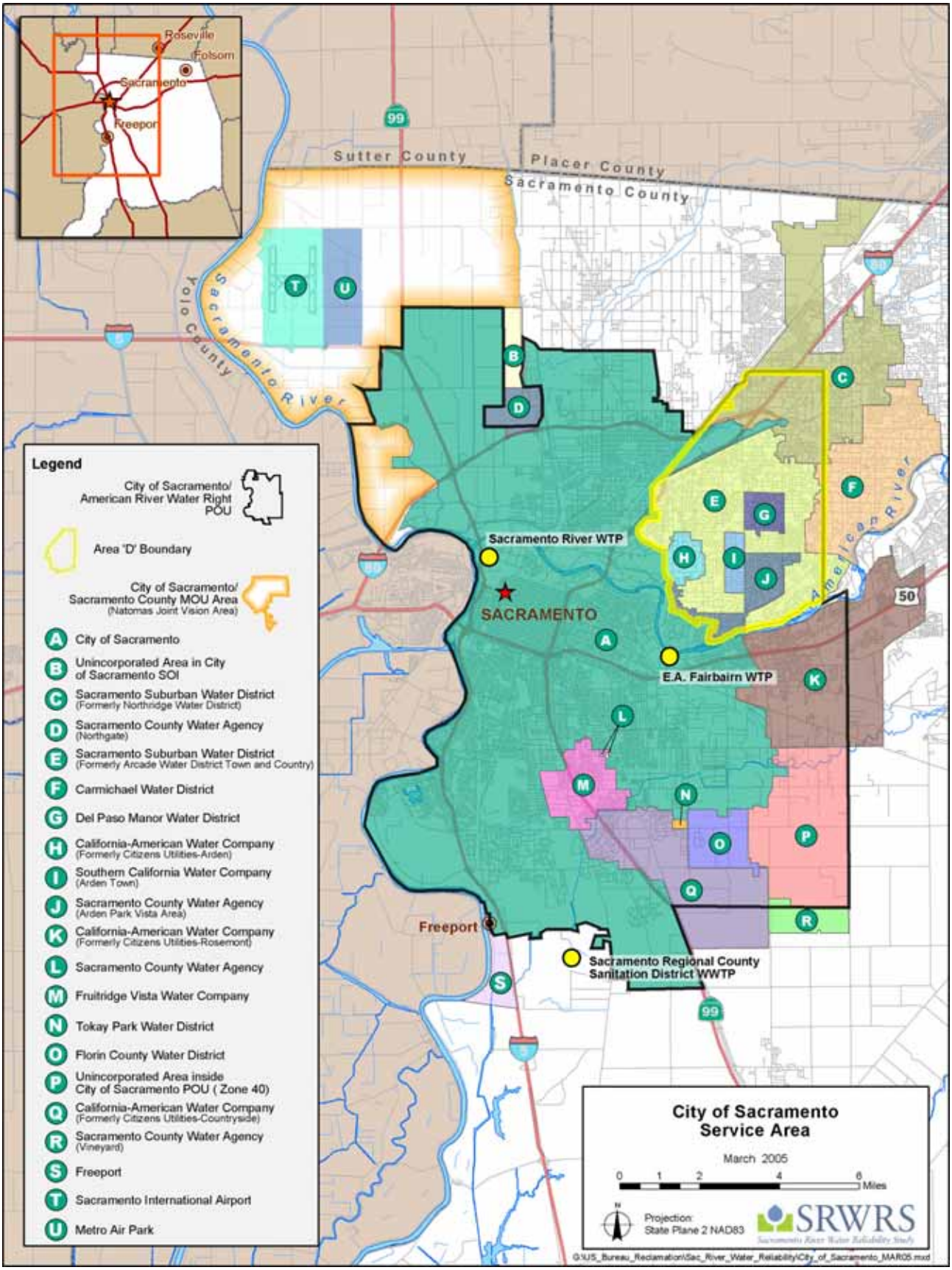


Figure 3-6. Sacramento Service Areas

WFA Water Management Actions for Environmental Purposes

As water supply demands for the cost-sharing partners increase, WFA water management actions for the purpose of environmental preservation become the major limiting factors for water supply reliability.

Reducing Future Diversions from the American River in Drier Years

Tables 3-6 and 3-7 summarize WFA year-type-dependent limitations on diversions from the American River for the cost-sharing partners that were stipulated in their corresponding WFA PSAs. The WFA defines year types for the American River Basin based on March through November unimpaired inflow to Folsom Lake, as follows: wet (above 1,600,000 AF), normal (between 1,600,000 and 950,000 AF), drier (between 950,000 and 400,000 AF), and driest years (below 400,000 AF).

Note that most purveyors are limited by diversion amounts; however, Sacramento is limited by the allowable diversion rate at the Fairbairn WTP depending on the bypass flow rate, and limited by the total annual diversion at the Fairbairn WTP in Water Forum driest years. These limitations restrict the SRWRS cost-sharing partners from exercising water rights and contract entitlements on the American River.

Releasing Supplemental Flow from Storage

Under the WFA, PCWA and Roseville would provide supplemental flows in Water Forum drier and driest years to the lower American River by releasing from PCWA's MFP storage. These releases are generally referred to as "replacement water."

The purpose of the replacement water is to offset reductions in flows in the lower American River due to increased future PCWA and Roseville diversions from the American River during drier and driest years. Replacement water would remain in the American River until it reaches its confluence with the Sacramento River. However, PCWA has agreed to release the replacement water from its MFP reservoirs only when a water transfer partner exists below the American River outlet.

Table 3-8 summarizes the responsibilities of providing replacement water as stipulated in the WFA. The source of replacement water is from reoperation of PCWA's MFP reservoirs; this operation would be further subject to refill conditions currently under negotiation between Reclamation and PCWA, and ongoing negotiation for the lower American River FMS.

Groundwater Basin Safe Yield

The SRWRS study area covers the WFA-defined North and South basins of groundwater in Sacramento County, and the Placer-Sutter groundwater basin north of the Sacramento county line. The North Basin is bordered by the American and Sacramento rivers and the Placer-Sacramento county line, and the South Basin is bordered by the American, Sacramento, and Consumnes rivers. The WFA has established safe yields[15] of 131,000 AF per year for the North Basin, and 273,000 AF per year for the South Basin. These safe yields are close to anticipated groundwater use in these two basins, respectively, in the future under the WFA, allowing only limited deviation from WFA assumed conditions for water supply and conjunctive use.

The Placer-Sutter groundwater basin is hydraulically connected to the North Basin; however, the Placer-Sutter groundwater basin's safe yield has not been established by the WFA. Currently, PCWA is conducting a study for this purpose.

[15] Safe yield is the maximum quantity of water that can be withdrawn from a groundwater basin over a long period of time without developing a permanent condition of overdraft. Sometimes referred to as sustainable yield.

Table 3-6. Summary of Water Rights and Contract Entitlements and the Associated WFA Limitations on Diversion by Cost-Sharing Partner

SRWRS Cost-Sharing Partner	Water Rights and Contract Entitlements (amount in AF per year)						WFA Limitations on Diversions by Water Forum Year-Type (AF per year)			
	American River		Sacramento River		Drum-Spaulding Canal System		Wet	Normal	Drier	Driest
	Amount	Source	Amount	Source	Amount	Source				
PCWA					100,400	PG&E	No specific limitations per the WFA			
	120,000[1]	MFP					35,500	35,500	35,500	35,500
	35,000	CVP					0[2]	0[2]	0[2]	0[2]
SSWD	29,000[1]	MFP					29,000	0[2]	0[2]	0[2]
	26,064	Water rights (via Sacramento)					26,064	26,064	0[2]	0[2]
Roseville	32,000	CVP					54,900[3],[4]	54,900[3],[4]	39,800 to 54,900[3],[4],[5]	39,800[4]
	30,000[1]	MFP								
	4,000	MFP (via SJWD)					4,000	4,000	0	0
Sacramento	245,000	Water rights					Depends on bypass flow at Fairbairn WTP[2] (see Table 3-7)			50,000[2]
			81,800	Water rights			No specific limitations per the WFA			

[1] The 120,000 AF per year of PCWA MFP water rights includes 84,000 AF of water sales to SJWD (25,000 AF per year), Roseville (30,000 AF per year), and SSWD (29,000 AF per year).
[2] The WFA anticipates and/or allows diverting forgone flows from the Sacramento River.
[3] Includes transfer of 4,000 AF from SJWD in wet and average years.
[4] WFA limitations are on the total amount of diversions from all sources.
[5] Linearly proportional based on March-through-November unimpaired inflow to Folsom Lake between 400,000 and 950,000 AF.

Table 3-7. Summary of WFA Limitations on Sacramento's Diversions at Fairbairn WTP Under Its Water Rights

Criteria	Period	Maximum Diversion Rate at Fairbairn WTP	
		(cfs)	(mgd)
If the flow bypassing the diversion at the FWTP is greater than the Hodge Flows [1],[2]	1/1 – 12/31	310	200
If the flow bypassing the diversion at the FWTP is less than the Hodge Flows [1],[3],[4]	1/1 – 5/31	120	78
	6/1 – 8/31	155	100
	9/1 – 9/30	120	78
	10/1 – 12/31	100	65

[1] Hodge Flows: Parties to the litigation (Environmental Defense Fund et al. v. East Bay Municipal Utility District) cannot divert water from the American River unless instream flows measure at least 2,000 cfs from October 15 through February; 3,000 cfs from March through June; and 1,750 cfs from July through October 14.

[2] In accordance with wholesale agreements, Sacramento may deliver water diverted or treated at Fairbairn WTP to public or private water purveyors on a wholesale basis anywhere within the POU as it existed on January 1, 1997, when flow bypassing the Fairbairn WTP is greater than the Hodge Flow Condition.

[3] Water diverted or treated at the Fairbairn WTP may be delivered on a wholesale or wheeling basis to any public or private water purveyors when bypass flow at the Fairbairn WTP is less than the Hodge Flow Condition, provided the rate of "pumpback" is equal to or exceeds the rate of delivery for these purposes on a daily basis. "Pumpback" is used to assume the existence of a metered raw water conveyance facility delivering water from near the confluence of the Sacramento and American rivers to the Fairbairn WTP.

[4] For all conditions in extremely dry years (Water Forum driest years and/or when annual projected unimpaired inflow into Folsom Lake is 550,000 AF or less), and the annual diversion from Sacramento's water rights is further limited to 50,000 AF.

Table 3-8. Responsibility for Providing Replacement Water by Purveyor as Defined in the WFA

Water Forum Year Type	Annual Amount of Replacement Water[1] by Purveyor (AF)	
	PCWA	Roseville
Wet and Average	0	0
Drier	0 to 27,000[2]	0 to 20,000[2]
Driest	27,000	20,000

[1] The water will be made available by reoperation of PCWA's MFP reservoirs. Releases will be contingent on the following conditions:

a. PCWA's ability to sell the released water for use below the lower American River on terms acceptable to PCWA.
b. PG&E's agreement to such reoperation until the present power purchase contract with PG&E expires in 2013.
c. PCWA's determination that it has sufficient water in its reservoirs for additional releases to mitigate conditions in dry years without jeopardizing the supply for PCWA's customers. (Based on historical hydrology and projected 2030 requirements as set forth in the WFA, previous operational modeling shows that reoperation water should be available for such release and sale without drawing MFP reservoirs below 50,000 AF.)

[2] Linearly proportional based on March-through-November unimpaired inflow to Folsom Lake between 400,000 and 950,000 AF.

Threat of Groundwater Contamination

Industrial contamination plumes have threatened groundwater resources in the Placer-Sacramento region. These contamination plumes have forced some drinking water wells to be taken out of service, and continued to threaten other local groundwater supplies.

Principal groundwater contaminant plumes in this area are known to exist from source areas at the former McClellan AFB, the former Mather AFB, and Aerojet. The most extensive contaminant from the former AFBs is trichloroethylene (TCE), and plume boundaries of 5 micrograms per liter (µg/L) are shown in **Figure 3-7**. Currently, a primary maximum contaminant level (MCL) of 5 µg/L exists for drinking water. Horizontal and vertical migration of contaminant plumes for McClellan and Mather AFBs are understood, and a hydraulic capture zone has been established for the majority of the plumes to control contaminant migration.

TCE contaminant exists at the Aerojet site as well; however, perchlorate is a more widespread contaminant of greater concern, unique to the Aerojet site. Perchlorate was used as rocket fuel at the test site. A recent discovery of perchlorate contamination north of the American River was unexpected, indicating lack of control for perchlorate contamination or understanding of the migration pattern of perchlorate. This development heightened the threat to the water supply in Fair Oaks, Carmichael, and Rancho Cordova areas where groundwater is the sole or major source of water supply.

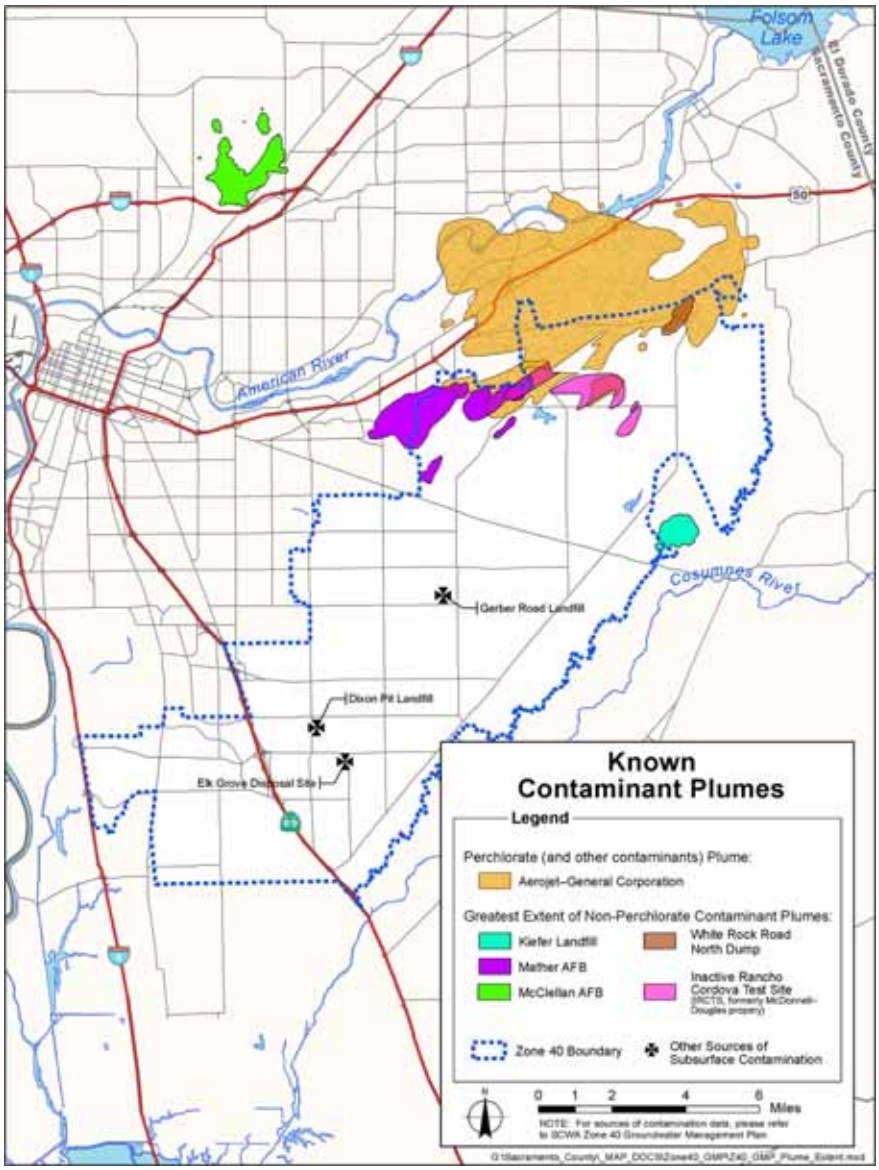


Figure 3-7. Map of Known Major Contamination in Sacramento County (Source: SCWA, 2004, Zone 40 Groundwater Management Plan)

CHAPTER 4. WATER AND RELATED RESOURCES PROBLEM AND OPPORTUNITIES

This chapter discusses identified water and related resources problems and opportunities based on the without-project conditions described in **Chapter 3.** The SRWRS will formulate solutions for the identified problems; these solutions could contribute to the identified opportunities, resulting in potential ancillary benefits.

The following are identified problems and opportunities (described in detail below):

- Water supply reliability in the Placer-Sacramento region (Problem)
- Enhancement of CVP operational flexibility (Opportunity)
- Promotion of ecosystem preservation in the lower American River (Opportunity)
- Coordination with ABFSHIP for regional benefits (Opportunity)

Opportunities to promote Delta ecosystem restoration may exist by shifting a number of future American River diversions to an alternate location; however, such opportunitites may depend on other factors such as SWP actions, lower Sacramento River diversions, EWA operations, and other ongoing projects and programs. Therefore, this benefit is not identified as an opportunity in the SRWRS.

WATER SUPPLY RELIABILITY IN THE PLACER-SACRAMENTO REGION (PROBLEM)

Conjunctive use is the strategy in the WFA for long-term water supply reliability. This strategy includes allowing water purveyors to divert surface water according to their surface water rights and contract entitlements in wet years, and in dry years, reduce their surface diversions, increase use of groundwater and other supplemental water, and/or provide supplemental instream flow through storage release.

Challenges in Implementing Conjunctive Management

While the above programmatic concept for long-term water supply reliability has been accepted, individual water supply facility planning and construction are subject to project-specific evaluation and approval. Therefore, the problem of water supply reliability in the Placer-Sacramento region continues mainly because of lack of major infrastructure for implementing the programmatic concept and groundwater contamination. With recent expansion of the Sacramento Fairbairn and Sacramento River WTPs, construction of the PCWA ARPS, and completion of the Freeport Regional Water Project environmental review process, the SRWRS is the only remaining major infrastructure plan to be completed for realizing the goals envisioned by the WFA of surface water development and conjunctive use management.

The intensified threat of groundwater contamination in the region (described in **Chapter 3**) has raised concerns about loss of perceived groundwater availability in this region to support planned development and facilitate conjunctive management. Production wells have been shut down due to groundwater contamination from Aerojet, and groundwater supply could be further impacted because the perchlorate contamination is not contained and its migration pattern and extent are currently undefined.

The WFA anticipates that groundwater supply would not be affected by contamination, assuming all contamination would be under control and remediated. However, recent unexpected migration of the Aerojet perchlorate plume across the American River indicates otherwise. The lack of understanding of the

migration pattern and extent of perchlorate further concerns water purveyors relying solely or largely on groundwater for their water supply.

As a result, local water purveyors are seeking greater regional collaboration to improve planning and operational efficiency, diversify sources of water, and expand infrastructure interconnection and redundancy to ensure long-term water supply reliability. Purveyors with surface water rights and contract entitlements plan to use their available surface water consistent with their Water Forum commitments to environmental preservation, and to further reduce their reliance on groundwater. Others without surface water rights and contract entitlements sought collaboration from holders of water rights and contract entitlements to diversify their portfolio of water sources without violating WFA principles. For example, purveyors in the Sacramento POU are seeking opportunities for Sacramento to provide surface water to their service areas to take advantage of Sacramento's available surface water rights.

Potential Deficiency in Water Supply Reliability

Potential deficiencies in water supply reliability for SRWRS cost-sharing partners are summarized in **Table 4-1.** The projection is based on a preliminary modeling simulation, which is subject to revision as the study progresses. Results show that WFA limitations on diversions from the American River would become a limiting factor for water supply in the Placer-Sacramento area under the assumed conditions, and implementation of water management measures in each cost-sharing partner's WFA PSA.

PCWA and Roseville would have deficiencies of up to about 34,500 and 5,000 AF per year, respectively, in all Water Forum year-types. For SSWD, surface water is a source of water supplemental to its groundwater resources and thus, no projected water supply deficiency would exist. However, with the threat of reduced groundwater availability due to contamination, reduced application of surface water entitlements could affect the long-term regional water supply reliability for this agency.

The quantity of potential deficiency for Sacramento is not easily defined because its WFA limitations on diversions from the American River are flow-based. The potential deficiency would be affected by hydrologic conditions in the American River basin and the operation of Folsom Dam by Reclamation. The Below Hodge Conditions may become a controlling factor even in wet and average years. A preliminary assessment indicates that the Hodge Condition could occur in about 50 percent of wet and average years, causing depiction of potential water supply deficiency to be inaccurate if summarized by Water Forum year-type; thus, an average of all years is used. Preliminary monthly modeling results suggest an average deficiency of 17,000 AF per year in surface water supply; however, this may have been underestimated because the deficiency in facility capacity could be a greater control factor for Sacramento's real-time operation for water supply.

Table 4-2 compares max-day demand and total available (or allowable) capacity at the Fairbairn and Sacramento River WTPs. The significant deficiency in facility capacity would result in increased reliance on groundwater use and limited ability to assist neighboring purveyors who rely solely or heavily on groundwater; both would negatively affect conjunctive management and thus, long-term water supply reliability in the Placer-Sacramento region.

ENHANCEMENT OF CVP OPERATIONAL FLEXIBILITY (OPPORTUNITY)

The opportunity to enhance CVP operational flexibility could occur through implementation of WFA elements, which would result in reducing future diversions from the lower American River and supplementing dry-year inflows to Folsom Lake with upstream storage releases. The SRWRS could contribute to realizing these management actions, as well as to the highly related opportunity for promoting ecosystem preservation in the lower American (discussed in more detail below).

Table 4-1. Potential Future Water Supply Deficiency for PCWA, SSWD, and Roseville

Water Forum Year-Type[1]	Water Purveyor	Type of Use	Demand (AF per year)	Supply (AF per year)			Unmet Demand (AF per year)
				Surface Water[2]	Groundwater	Others[3]	
Wet Years	PCWA	Ag	140,000	85,000	51,000	4,000	0
		M&I	85,400[2]	50,900	0	0	34,500[4]
	SSWD	M&I	92,227	55,064	37,163	0	0
	Roseville	M&I	64,020	58,900	0	2,773	2,347
Driest Years	PCWA	Ag	140,000	57,892	66,000	4,000	12,108[5]
		M&I	85,400[2]	50,900	0	0	34,500[4]
	SSWD	M&I	92,227	3,500	88,727	0	0
	Roseville	M&I	64,020	39,800	7,300	11,993	4,927

[1] Projection for wet and driest years only bracket the water supply conditions because the corresponding limitations on diversions from the American River for these purveyors are Water Forum year-type dependent.
[2] Surface water supply is limited by WFA when diverted from the American River. Surface water allocation was based on monthly results from a preliminary CALSIM modeling study, which is subject to further refinements as the study progresses.
[3] For PCWA, reclaimed water; for Roseville, reclaimed water and extra ordinary conservation.
[4] Demand and unmet amounts are based on a slow-growth projection. A future realized growth greater than the assumed slow-growth projection would result in additional unmet demand.
[5] Agricultural deficiency in areas without groundwater accessibility.

Table 4-2. Projected Future Water Supply Deficiency for Sacramento

(a) in Annual Average Volume

Water Forum Year-Type	Water Purveyor	Type of Use	Demand (AF per year)	Supply (AF per year)			Unmet Demand (AF per year)
				Surface Water[1]	Groundwater	Others[2]	
All Years[3]	Sacramento	M&I	239,804	222,804[3]	7,136	0	17,000

[1] Surface water supply is limited by WFA when diverted from the American River. Surface water allocation was based on monthly results from a preliminary CALSIM modeling study, which is subject to further refinements as the study progresses.
[2] For Sacramento, no currently approved use exists for other sources of water.
[3] Projection represents the average of all year-types because the corresponding limitations on diversions from the American River for Sacramento are flow-dependent. The Hodge conditions, defined in Table 3-7 for triggering the diversion limitations from the American River, could occur in all year-types.

(b) in Max-Day Capacity

Water Forum Year-Type	Hydrologic Condition	Type of Use	Surface Water Demand (AF per year)	Capacity Needs (mgd)			Available Max-Day Supply[2] (mgd)	Unmet Max-Day Demand (mgd)
				Max-Day Demand	Wheeling for Sacramento County[1]	Total		
Driest Years	All	M&I	232,668	378	23	401	260	141
All Other Years	Above Hodge[3]	M&I	232,668	378	23	401	360	41
	Below Hodge[4]	M&I	232,668	378	23	401	260	141

[1] Wheeling for Zone 40 and Zone 50.
[2] The installed capacity of the Sacramento River WTP is 160 mgd, and that of the Fairbairn WTP is 200 mgd. The diversion rate at the Fairbairn WTP is subject to limitations in the WFA.
[3] Above Hodge: The American River flow is above the flow thresholds set forth by the Hodge decision. (See Table 3-7 for definition.)
[4] Below Hodge: The American River flow is below the flow thresholds set forth by the Hodge decision. (See Table 3-7 for definition.)

As an integral part of the CVP, Folsom Dam is operated for contract deliveries, flood management, instream flow needs in the lower American River, and water quality needs in the Delta. The operation of Folsom Dam is especially critical in meeting Delta water quality objectives in D-1641, which requires that the CVP and SWP meet Delta water quality flow objectives (except for salinity objectives in the south Delta) until a settlement is reached with other Sacramento Valley water right holders. Since Folsom Reservoir is the closest water source to the Delta, releases from Folsom Dam often are used first to maintain Delta water quality standards when Delta conditions deteriorate. A release is reduced once standards are met or increased flows from other reservoirs arrive in the Delta.

This existing operational flexibility provided by Folsom Reservoir for D-1641 compliance would be further affected by increasing needs for water supply, flood control, and fishery management in the American River. The increased demand in the American River basin (especially in the upper basin) would reduce available water to the CVP for water supply purposes and flow management in the lower American River and in the Delta. The recently completed OCAP BO by NOAA Fisheries indicates that the ablity to fill Folsom Reservoir in May would be reduced from 50 percent to 40 percent between conditions today and conditions in the future as water demand in the American River basin increases from a total of 256 thousand acre-feet (TAF) at the 2001 level of development (LOD) to 688 TAF at a 2020 LOD. Since 1996, Reclamation implemented a dynamic allocation of flood control space from 400,000 to 670,000 AF based on SAFCA's recommendation; this action also may result in less storage in some hydrologic conditions such as that of 1997. Increasing needs for additional instream flow requirements and other fishery management goals in the American River would also compete for limited water and storage behind Folsom Dam, as explained in the following opportunity for promoting ecosystem preservation in the lower American River.

PROMOTION OF ECOSYSTEM PRESERVATION IN THE LOWER AMERICAN RIVER (OPPORTUNITY)

The opportunity to promote ecosystem preservation in the lower American River could come from implementing projects contributing to the water supply reliability objective of the WFA and thus, facilitate progress in the other Water Forum co-equal objective of preserving the lower American River. This opportunity may accompany the opportunity for enhancing CVP operational efficiency, as described above.

Lower American River instream flow requirements were originally defined in SWRCB D-893. The SWRCB then increased the D-893 minimum release schedule through D-1400. This decision was applied to the water rights permit for Auburn Dam and does not apply to operation of Folsom and Nimbus dams. However, Reclamation voluntarily operates Folsom and Nimbus dams to meet a modified D-1400 for minimum fishery flows, and more recently has striven to meet recommended AFRP flows for the lower American River under the CVPIA.

Although Reclamation implemented AFRP flow objectives in the lower American River, temperature control problems still exist due to the relatively small coldwater pool available in Folsom Reservoir. To protect Central Valley spring-run Chinook salmon and steelhead, the 2002 BO on interim operations of the CVP and SWP sepecifies ramping criteria for releases from Nimbus Dam. The BO also requires Reclamation, to the extent possible, to control water temperatures in the lower American River between Nimbus Dam and the Watt Avenue Bridge (RM 9.4) from June 1 through November 30 to maintain a daily average temperature of less than or equal to 65 degrees Fahrenheit (ºF) to protect juvenile steelhead from thermal stress and warmwater predator species. This BO resulted in a significant conflict for Folsom Dam operations due to the different life stages of these two targeted species at any given time. Also, the amount of cold water in Folsom Lake that could be released to meet temperature requirements for spawning and rearing of both fall-run Chinook salmon and steelhead is limited.

Currently, Reclamation receives recommendations from the interagency American River Operation Work Group (AROG) on seasonal fluctuations and ramping of stream flows in the lower American River. With input from AROG, Reclamation continues to adaptively manage lower American River temperatures through a combination of flow releases and intake shutter operations. The goal of this adaptive management is to

provide suitable temperatures during the summer months for the Nimbus Fish Hatchery and rearing juvenile steelhead, while minimizing the loss of the coldwater pool remaining for spawning fall-run Chinook salmon.

The 2004 OCAP BO by NOAA Fisheries indicates that the impacts of CVP and SWP operation on the American River would increase with the predicted increase in water demand. Recognizing that Reclamation is adaptively managing river temperature in coordination with NOAA Fisheries staff and AROG, the OCAP BO indicates additional protection of endangered and threatened species through coordination with the WFA for implementing associated water management actions to reduce future diversions from the American River and to provide supplemental flow with releases from upstream storage.

COORDINATION WITH ABFSHIP FOR POTENTIAL REGIONAL BENEFITS (OPPORTUNITY)

The ABFSHIP proposes to consolidate five existing NMWC diversions and one other diversion of local riparian water right holders on the Sacramento River into one or two new diversion facilities with fish screens. The WFA recommends the consolidation and screening of these diversions to benefit the environment and Sacramento River fisheries. PL 106-554 authorized a feasibility study for a Sacramento River diversion with facilities considered under both the SRWRS and ABFSHIP; however, these two studies have been developed as separate projects due to their different stages in the planning process.

The development of ABFSHIP is independent of SRWRS development. The opportunity for coordinating efforts of ABFSHIP and the SRWRS stems from potential reduction in overall environmental impacts that may be associated with having two major diversions in the less-than-2-mile reach of the Sacramento River, and increase in regional water management flexibility that may be realized through a collaborative approach in the urbanizing Natomas Basin. Local water purveyors (including NMWC and SRWRS cost-sharing partners) have been discussing issues of consolidating diversion needs for SRWRS cost-sharing partners and for NMWC's planned Elkhorn Diversion under the ABFSHIP Sankey/Elkhorn Diversions alternative, which is one of the three alternatives considered in the ABFSHIP environmental compliance process. As suggested in NMWC's 2000 ABFSHIP Feasibility Study Technical Report, the Sankey/Elkhorn Diversions alternative is the most feasible alternative and allows more flexibility in water management to fulfill NMWC's commitments for providing landscape irrigation water to the Sacramento International Airport, and facilitate required service to M&I purveyors in the Natomas Basin if the projected land use change from agriculture to urban occurs.

Implementation of the SRWRS is anticipated by local agencies, but implementation of ABFSHIP will rely on Federal and State funding from the AFSP and CALFED program. Despite progress in the environmental process, potential delay in full installment of Federal funding may result in staging or delay in construction of one or both ABFSHIP diversions, creating the opportunity of coordination between ABFSHIP and the SRWRS to maximize the potential regional benefits without impacting the schedule of improvements for fishery protection. While a preliminary protocol was developed for coordinating these two projects through a multi-agency coordination meeting,[16] success in realizing this opportunity depends on the progress of the two projects and agreements among local water agencies.

[16] Reclamation held this multi-agency coordination meeting on January 14, 2004. Participants include Reclamation, FWS, NOAA Fisheries, CALFED, CDFG, NMWC, and SRWRS cost-sharing partners. See Chapter 8 for detail.

THIS PAGE LEFT BLANK INTENTIONALLY

CHAPTER 5. PLAN FORMULATION APPROACH

This chapter discusses the process of formulating plans for the SRWRS based on the identified problems and opportunities, and presents the planning objectives, planning constraints, and criteria for the study.

PLAN FORMULATION PROCESS

The SRWRS will be developed consistent with the programmatic ARWRI and WFA, and will conduct a project-specific analysis to evaluate the feasibility of a Sacramento River diversion that is consistent with WFA objectives. Development of the SRWRS consists of the following six steps:

1. Identifying the existing resource conditions and future water supply reliability needs of each cost-sharing partner.

2. Defining water resources problems and opportunities to be considered in the SRWRS.

3. Developing objectives for formulating alternatives and associated planning criteria and constraints.

4. Formulating potential solutions (alternatives) to meet the identified objectives while satisfying the planning criteria and constraints.

5. Evaluating and comparing potential effects of these alternatives, including accomplishments in meeting objectives, resulting water supply and environmental impacts, and economic considerations.

6. Recommending a plan for implementation based on comparing the alternative plans.

These six steps can be incorporated generally into four phases of SRWRS development:

- **Initial Investigation Phase.** Identify without-project conditions, define resulting resources problems and opportunities, define a specific set of planning objectives, identify constraints and criteria for addressing the planning objectives, and develop a concise study goal based on study objectives.

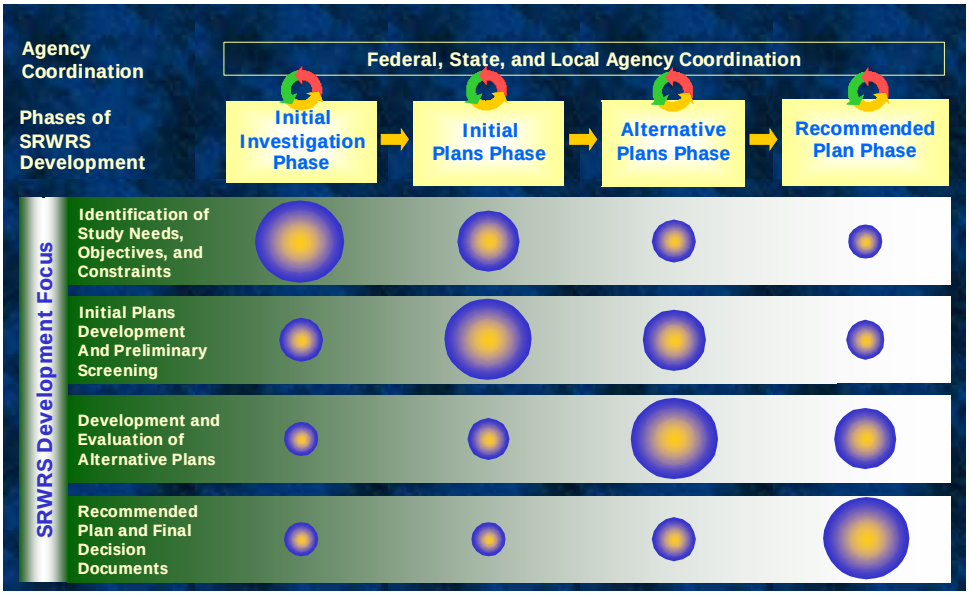
- **Initial Plans Phase.** Identify potential resources management measures to address planning objectives, and formulate, coordinate, and compare a set of concept plans. From these concept plans, identify a set of initial alternatives.

- **Alternative Plans Phase.** From the initial alternatives, formulate specific alternative plans to address the planning objectives; evaluate, coordinate, and compare the plans; and identify a plan for tentative recommendation.

- **Recommended Plan Phase.** Complete development of a tentatively recommended plan, and prepare, coordinate, and process supporting documentation for final decisions.

Throughout these four phases, objectives and tasks of all phases are considered; however, the primary focus varies from phase to phase. Evolution of the primary study focus throughout SRWRS development is illustrated in **Figure 5-1**. Progress in each phase needs to be coordinated closely with Federal, State, and local agencies, other stakeholders, and related studies, projects, and programs. The SRWRS is currently in the Alternative Plans Phase; this **Initial Alternatives Report** concludes efforts in the previous two phases.

Figure 5-1. Phases of SRWRS Development and Corresponding Focus



PLANNING OBJECTIVES

To address the identified water supply reliability problem and satisfy the study authorizing legislation, the following planning objectives for the SRWRS were identified:

- Provide additional water supply to PCWA to meet water demands resulting from planned urban growth
- Provide additional water supply to SSWD to enhance the Groundwater Stabilization Project
- Provide additional water supply to Roseville to meet water demands resulting from planned urban growth and to facilitate a local conjunctive use program
- Provide additional water supply capacity for Sacramento to ensure water supply reliability and to provide retail and wholesale services within Sacramento's POU, and wheeling services to neighboring water purveyors to meet water demands and reduce groundwater reliance
- Maximize long-term water supply reliability in the Placer-Sacramento region through increased system interconnectivity, and source redundancy through conjunctive use of groundwater and cost-sharing partners' existing surface water rights and contract entitlements

These objectives were used for formulating alternatives and when considering the planning constraints and criteria discussed below.

PLANNING CONSTRAINTS AND CRITERIA

Planning constraints and criteria used to guide the SRWRS are described in this section.

Planning Constraints

Planning constraints primarily consist of existing Federal, State, and local laws, regulations, policies, and agreements, as highlighted below. Constraints related to water delivery quantities considered in the SRWRS are discussed first and separately due to their prevailing significance for formulating alternatives.

Water Delivery Quantities

For the SRWRS, the cost-sharing partners will consider only alternatives that use **existing** water rights and contract entitlements. **Table 5-1** summarizes requests for additional surface water diversions and treatment capacities necessary to balance projected 2030 demand and supply and to enhance water supply reliability.

Table 5-1. Water Delivery Quantities Considered in the SRWRS

Water Purveyor	Maximum Additional Annual Water Deliveries (AF)	Source	Type of Use	Additional Treatment Capacities (mgd)	Purpose of Additional Treatment Capacities
PCWA	35,000	CVP	M&I	65	Max-day demand
SSWD	29,000[1]	MFP	M&I	15	Reliability and redundancy
Roseville	7,100[2]	MFP	M&I	10	Max-day demand
Sacramento	17,000[3]	Water rights, water wheeling requests	M&I	145	Max-day demand
Total	88,100			235	

[1] For Water Forum average, drier, and driest years only; the WFA allows SSWD to exercise this entitlement in Water Forum wet years using diversions from the American River.

[2] Roseville would only consider additional diversions from a river other than the American River.

[3] The WFA does not establish a volumetric limitation for Sacramento's total diversion; the estimated additional water supply to meet its projected demand is about 17,000 AF per year, based on the difference between projected demand and the simulated average diversion for Sacramento that could be realized using then-existing diversion facilities on the American and Sacramento rivers. However, Sacramento could divert up to 81,800 AF per year under its water rights on the Sacramento River at a new diversion by reducing the diversion under its Sacramento River water rights at its existing Sacramento River WTP downstream of the confluence with the American River.

Laws, Regulations, Policies, and Agreements

Development of the SRWRS will be consistent with the following Federal, State, and local laws, regulations, policies, and agreements that govern the operation of statewide and local water supply systems:

- Satisfying requirements stipulated in PL 106-554 (the Congressional authorizing legislation for the SRWRS) to complete a feasibility study for a Sacramento River diversion that is consistent with the WFA and includes the following components: (1) development of a range of reasonable options, (2) an environmental evaluation, and (3) consultation with Federal and State resource management agencies regarding potential impacts and mitigation measures. Furthermore, Congress requires the SRWRS to be developed in coordination with the CALFED Program.
- For Roseville and SSWD, considering a diversion location from other than the American River only when a concurrent consideration of PCWA's CVP delivery exists. That is, Roseville and SSWD are not considering developing a diversion location on rivers other than the American River without PCWA.

- Observing other existing applicable laws, regulations, water rights, contracts and agreements, including, but not limited to, the following:
    - California laws, particularly Water Codes, and obligations of the cost-sharing partners in their charters and as defined in California laws
    - CVPIA, especially the dedication of (b)(2) water from CVP contract entitlements
    - SWRCB D-1641 and the WQCP
    - Existing water rights, local water contracts and/or agreements, and CVP/SWP water service contracts
    - NEPA, CEQA, and ESA, including BOs for the Sacramento River, American River, and Delta related to operations of the CVP, SWP, and local projects

List of Major Existing Laws, Regulations, Policies, and Agreements Applicable to the SRWRS

1902 Reclamation Act
1917 Flood Control Act and subsequent Flood Control Acts
Archaeological Resources Protection Act
BOs for CVP and SWP Operations
CALFED Program and Programmatic ROD
California Department of Fish and Game Codes
California ESA
California Water Codes
California Water Rights
CEQA
Clean Air Act
Clean Water Act
Coordinated Operation Agreement
CVP and SWP Water Service Contracts
CVPIA
Delta Pumping Plant Fish Protection (4-Pumps) Agreement
Executive Order 11988, Flood Plain Management
Executive Order 11990, Protection of Wetlands
Farmland Protection Policy Act
Federal ESA
Federal Water Project Recreation Act
Fish and Wildlife Coordination Act
Historic and Archaeological Data Preservation Act
Indian Trust Assets
Joint Use Agreement
Magnuson-Stevens Fishery Conservation and Management Act
Monterey Agreement
National Historical Preservation Act
NEPA
Placer County Water Agency Act
Porter-Cologne Act
Protection of Historic Properties Act
Resource Conservation and Development Program
Sacramento Area Water Forum Agreement
Safe Drinking Water Act
San Joaquin River Management Agreement
State Reclamation Board Water Code 8608 and 8571
Urban Water Management Planning Act
USACE Water Control Manual
Vernalis Adaptive Management Plan
Watershed Protection and Flood Protection Act

Planning Criteria

In addition to the planning constraints, a series of planning criteria help guide plan formulation for consideration not only in formulating the initial set of alternatives but also in determining which alternatives best address the planning objectives. Many of the planning principles and guidelines are included in the Federal Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) and other Federal planning regulations concerning economic justification, environmental compliance, technical standards, etc. Considerations resulting from local policies, practices, and conditions also are important in the planning process for the SRWRS.

For the SRWRS, applicable principles and criteria include the following:

- Being consistent with the environmentally preferred alternative of the programmatic ARWRI, including the elements of regional groundwater conjunctive management and the position of no major dam construction in the upper American River basin.
- Being consistent with the WFA in pursuing a Sacramento River diversion to accomplish the following objectives envisioned in the agreement: (1) meeting the needs of planned future growth within the Placer-Sacramento region, (2) maintaining a reliable water supply while reducing diversions of surface water from the American River in future dry years to preserve the river ecosystem, and (3) enhancing groundwater conjunctive management to help sustain the quality and availability of groundwater for the future. Specific criteria include the following:
    - Limitations on the SRWRS cost-sharing partners' surface water diversions from the American River and associated conditions stipulated in their corresponding PSAs
    - Sustainable groundwater yields defined by the WFA in the North and South basins

  - Lower American River FMS, including revised minimal instream flow requirements for the lower American River and operation of PCWA's MFP for releasing replacement water per PCWA's and Roseville's PSAs[17]

  - Water conservation and reclamation guidelines

- Being consistent with Federal planning guidelines stipulated in the P&G, including four specific criteria for consideration in formulating and evaluating alternatives: (1) completeness, (2) effectiveness, (3) efficiency, and (4) acceptability

- Being consistent with the cost-sharing partners' planning guidelines and standards

- Minimizing overall impacts on the environment to the extent feasible

- Maximizing the use of existing water rights and contract entitlements owned by the cost-sharing partners to the extent feasible

- Maximizing the overall reliability of the Placer-Sacramento region's water supply system through increased interconnectivity and source diversity

- Being cost-effective

- Maximizing the opportunity to bring the recommended plan on-line by 2010

[17] As a separate effort, Reclamation is currently working with USFWS and the Water Forum to revise the FMS (see **Chapter 2** for details).

THIS PAGE LEFT BLANK INTENTIONALLY

CHAPTER 6. DEVELOPMENT OF PRELIMINARY ALTERNATIVES

The process of developing preliminary alternatives for the SRWRS is summarized in the following steps:

- Developing measures (i.e., partial solutions) for each cost-sharing partner's identified water supply needs
- Screening the measures for each cost-sharing partner by considering institutional issues and constructibility (implementability) issues
- Combining the retained measures into preliminary alternatives that fully address the identified planning objectives, and satisfy planning criteria and constraints

This chapter describes the above process and resulting preliminary alternatives for the SRWRS.

DEVELOPMENT OF MEASURES AS PARTIAL SOLUTIONS

Formulation of preliminary alternatives begins with identifying viable measures, which are partial solutions to the identified water supply reliability problems. Measures address a portion of the identified planning objectives within the planning constraints set forth for the SRWRS, as previously discussed, and fit in the following four categories:

- Surface storage
- Water conservation and recycling
- Groundwater use
- Surface water diversion

Surface Storage Measures

Surface storage measures would increase water supply availability to allow allocation of additional water rights and contract entitlements, and modify the timing of water supply availability. However, surface storage measures were eliminated from consideration in the SRWRS because they did not address the identified water supply reliability problem, even though they could improve overall efficiency and water supply shortages in statewide water management.

This finding is consistent with the conclusions of the ARWRI, stating that the Placer-Sacramento region has sufficient water rights and contract entitlements for planned development. Therefore, conjunctive management, discussed below, could be a more environmentally friendly alternative for water supply reliability. The resulting WFA is a programmatic approach that demonstrates the feasibility of the concept of conjunctive management.

Water Conservation and Recycling Measures

As previously mentioned in **Chapter 3**, projected demands for the SRWRS cost-sharing partners reflect a projected demand reduction of 25.6 percent due to implementation of BMPs for water conservation that are consistent with urban conservation goals of the California Urban Water Conservation Council, the CVPIA,

and CALFED Bay-Delta Program. The water conservation measures are currently administrated through RWA's WEP. Therefore, no additional measures for conservation were developed for the SRWRS.

The WFA does not include specific mandates regarding use of recycled water. PCWA and Roseville considered and included the planned use of recycled water as an alternate source of water supply in assessing water supply needs. SSWD and Sacramento have not adopted a policy regarding use of recycled water. Thus, no additional measures for recycled water use would be developed for the SRWRS.

Groundwater Use Measures

Groundwater supply is available in the Placer-Sacramento region, and continues to be a critical component of local water supply for agricultural and M&I uses. All SRWRS cost-sharing partners have access to groundwater, which is the main water source for SSWD and a supplemental water source for PCWA, Roseville, and Sacramento.

However, groundwater measures were removed from further consideration in the SRWRS because they are inconsistent with the identified planning objectives. As previously mentioned, the SRWRS is being developed under WFA Elements I and II with planning objectives to further increase use of the cost-sharing partners' surface water rights and contract entitlements to enhance the regional conjunctive use and groundwater management envisioned by the WFA for long-term water supply reliability.

Additional use of groundwater also could compromise the management goals of safe yield established in the WFA. Particularly, with the threat of uncontrolled Aerojet contamination, the region is seeking greater collaboration in diversifying water sources to ensure water supply reliability. Additional use of groundwater is not consistent with the direction of regional planning.

Other partner-specific reasons exist for removing groundwater measures from further consideration. For PCWA, using groundwater for new urban development in unincorporated Placer County areas is not consistent with the Placer County General Plan. Thus, PCWA has limited its groundwater use and is not seeking groundwater options in the SRWRS. The only opportunity for groundwater use in PCWA's service area is for the incorporated City of Lincoln (Lincoln). However, Lincoln is located near the edge of the Placer-Sutter groundwater basin, where groundwater development may be limited, and because of hydrogeological connectivity, Lincoln's groundwater supply reliability would be subject and sensitive to groundwater management of the basin in the County of Sacramento. Therefore, despite groundwater availability, long-term water supply reliability for Lincoln would still require a successful conjunctive use program on a Placer-Sacramento regional scale.

For SSWD, increasing use of groundwater is reverting to its current conditions and thus, this measure would address the water supply reliability problem.

For Roseville, and Sacramento, increasing groundwater use for unmet demand is a feasible option for water supply; however, it would be inconsistent with their long-term policy for reducing groundwater reliance.

Surface Water Diversion Measures

As previously mentioned, the cost-sharing partners have unused existing water rights and contract entitlements that can be used to resolve water supply reliability problems identified in the SRWRS. Therefore, these measures focus on location(s) where diversions can be made.

Identified Surface Water Diversion Measures

The partnership of Reclamation and the SRWRS cost-sharing partners broadens the range of diversion point options for PCWA, SSWD, and Roseville, whose water rights and/or contract entitlements are on the

American River. However, SSWD and Roseville will not develop a diversion on a river other than the American River without PCWA because the intended diversions are based on their MFP contract entitlements. Sacramento is unique among cost-sharing partners, owning water rights on both the American and Sacramento rivers. In other words, Sacramento does not rely on Reclamation's water rights on the Sacramento River in evaluating its options for additional diversions from the Sacramento River.

Due to the different attributes associated with the cost-sharing partners' water rights and contract entitlements, diversion location measures are best developed in a comprehensive and purveyor-specific manner by considering available sources of surface water around the study area from the American, Feather, and Sacramento rivers. Bear River was not considered as a potential source because it is a tributary of the Feather River and carries significantly less flow.

The following 12 potential diversion locations or river reaches were identified (see **Figure 6-1**):

1. Feather River near Nicolaus
2. Feather River from Nicolaus to the confluence with the Sacramento River
3. Natomas' Sankey Diversion on the Sacramento River
4. Natomas' Elkhorn Diversion on the Sacramento River
5. Sacramento River from the Feather River confluence to the American River confluence
6. Sacramento's Sacramento River WTP on the Sacramento River
7. Freeport Diversion of EBMUD and the County of Sacramento
8. Sacramento River from the American River confluence to Freeport
9. Sacramento's Fairbairn WTP on the American River
10. American River from Nimbus Dam to the Sacramento River confluence
11. Folsom Dam on the American River
12. PCWA's ARPS on the North Fork American River

Initial Screening of Surface Water Diversion Measures

Initial screening of measures was based on initial assessments of institutional requirements and constructibility. Major considerations for each surface water diversion measure by cost-sharing partner are summarized in **Table 6-1**. Surface water diversion measures are summarized below:

Several surface water diversion measures were not retained for any of the SRWRS cost-sharing partners, including the following:

2. Feather River from Nicolaus to the confluence with Sacramento River
6. Sacramento River WTP
7. Freeport Diversion
8. Sacramento River from the American River confluence to Freeport

9. Fairbairn WTP

10. American River from Nimbus Dam to the confluence with the Sacramento River

Surface water diversion measures retained for at least one of the SRWRS cost-sharing partners include the following:

1. Feather River near Nicolaus

3. Sankey Diversion (for PCWA, SSWD, and Roseville only)

4. Elkhorn Diversion

5. Sacramento River from the Feather River confluence to the American River confluence (with an Elverta Diversion location identified near Elverta Road for its advantageous bathymetric conditions)

11. Folsom Dam (for PCWA and SSWD only)

12. ARPS (for PCWA only)

Combined Elkhorn/Elverta Measure for Developing Preliminary Alternatives

A further combination of Measures 4 (Elkhorn) and 5 (Elverta) into an Elkhorn/Elverta measure for developing a preliminary alternative is a result of considering the less-than-2-mile distance between these two locations. Institutional considerations are similar for these two locations and both allow all cost-sharing partners to develop joint diversion and treatment facilities for the SRWRS.[18]

[18] Later analyses of alternatives suggest significant differences in engineering considerations at these two locations, as described in **Chapter 7**.

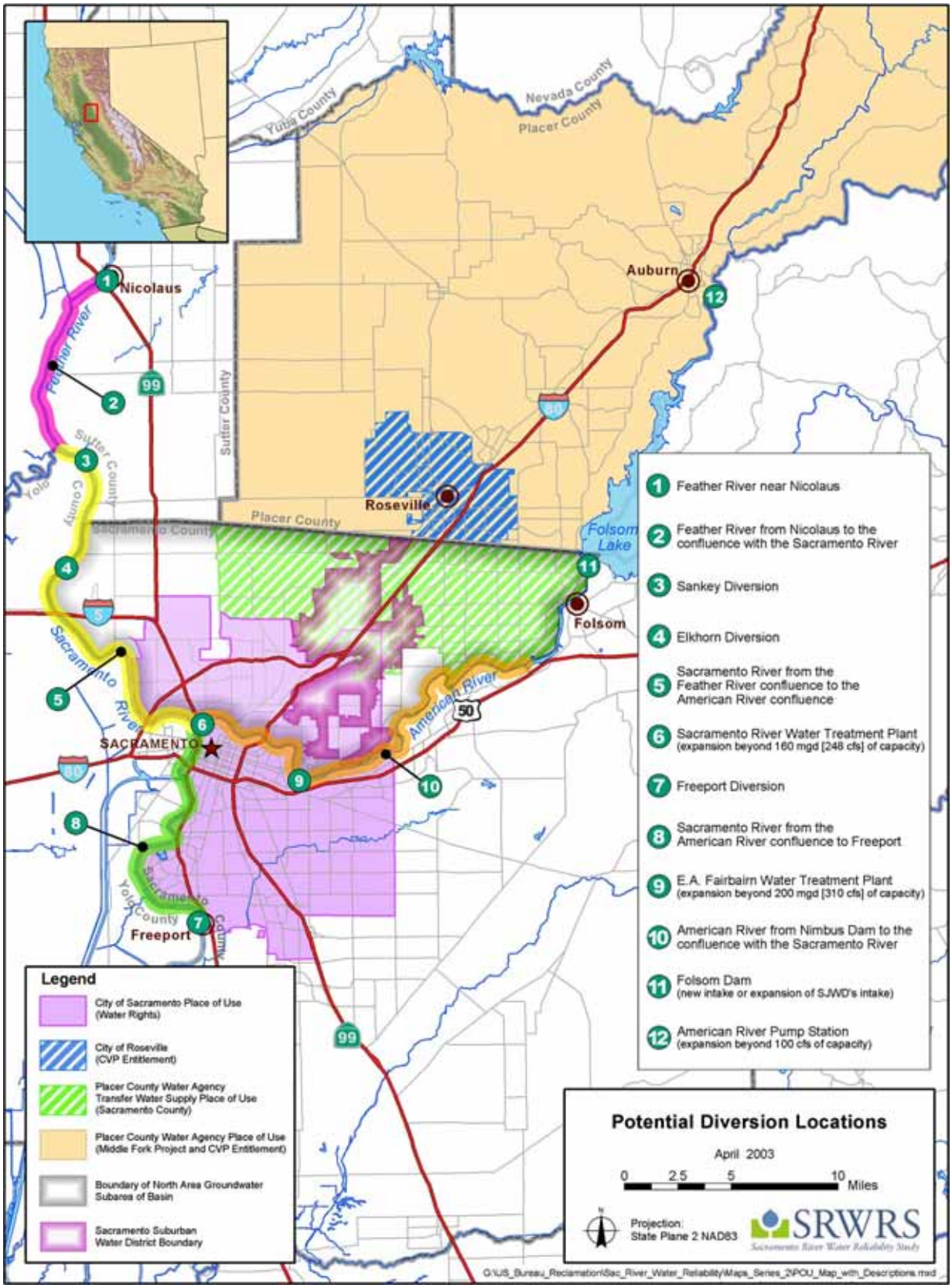


Figure 6-1. Potential Surface Water Diversion Locations for the Cost-Sharing Partners

THIS PAGE LEFT BLANK INTENTIONALLY

Table 6-1. Preliminary Screening of Measures by Cost-Sharing Partner

Measure	Major Considerations of Institutional Requirements and Constructibility by Cost-Sharing Partner							
	PCWA		SSWD		Roseville		Sacramento	
	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations
1. Feather River near Nicolaus	YES	Reclamation must approve a change in points of delivery for PCWA's CVP contract, and a further exchange agreement with the SWP is required.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, and further secure an additional exchange agreement with the SWP.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River. Reclamation must secure an additional exchange agreement with the SWP.	NO	Sacramento has water rights on the Sacramento River where flow is greater and requires no SWP involvement. No clear engineering or environmental benefits exist to justify the additional cost and institutional requirements.
2. Feather River from Nicolaus to confluence with Sacramento River	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract, and a further exchange agreement with the SWP is required. Unfavorable bathymetric conditions incur greater risks of sedimentation and safety, especially flooding.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, and further secure an additional exchange agreement with the SWP. Unfavorable bathymetric conditions incur greater risks of sedimentation and safety, especially flooding. SSWD will not develop a diversion at this location without PCWA.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, and further secure an additional exchange agreement with the SWP. Unfavorable bathymetric conditions incur greater risks of sedimentation and safety, especially flooding. Roseville will not develop a diversion at this location without PCWA.	NO	Sacramento has water rights on the Sacramento River where flow is greater and requires no SWP involvement. Unfavorable bathymetric conditions incur greater risks of sedimentation and safety, especially flooding. No clear engineering or environmental benefits exist to justify the additional cost and institutional requirements.
3. Sankey Diversion	YES	Reclamation must approve a change in points of delivery for PCWA's CVP contract. Coordination with NMWC is required for using its facility.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River. Coordination with NMWC is required for using its facility.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River. Coordination with NMWC is required for using its facility.	NO	The SWRCB must include this location as an authorized point of diversion in Sacramento's water right permits. Compared with Measures 4 and 5, no clear engineering or environmental benefits exist to justify the additional cost and institutional requirements to coordinate with Sutter County and NMWC.
4. Elkhorn Diversion	YES	Reclamation must approve a change in points of delivery for PCWA's CVP contract. Coordination with NMWC is required for using its facility.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River. Coordination with NMWC is required for using its facility.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River. Coordination with NMWC is required for using its facility.	YES	The SWRCB will need to include this location as an authorized point of diversion in Sacramento's water right permits. Coordination with NMWC is required.
5. Sacramento River from Feather River confluence to American River confluence (with identified Elverta Diversion location)	YES	Reclamation must approve a change in points of delivery for PCWA's CVP contract.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River.	YES	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River.	YES	The SWRCB must include this location as an authorized point of diversion in Sacramento's water right permits.

THIS PAGE LEFT BLANK INTENTIONALLY

Table 6-1. Preliminary Screening of Measures by Cost-Sharing Partner (Cont'd)

Measure	Major Considerations of Institutional Requirements and Constructibility by Cost-Sharing Partner							
	PCWA		SSWD		Roseville		Sacramento	
	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations
6. Sacramento River WTP	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract. The southern location is disadvantageous and costly for delivering water to PCWA's service area in Placer County. Due to its downtown location, further expansion of the Sacramento River WTP beyond 160 mgd would incur high costs and create a major disturbance in a developed urban area.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to SSWD's service area north of the American River. Due to its downtown location, further expansion of the Sacramento River WTP beyond 160 mgd would incur high costs and create a major disturbance in a developed urban area. SSWD will not develop a diversion at this location without PCWA.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to Roseville's service area in Placer County. Due to its downtown location, further expansion of the Sacramento River WTP beyond 160 mgd would incur high costs and create a major disturbance in a developed urban area. Roseville will not develop a diversion at this location without PCWA.	NO	Due to its downtown location, further expansion of the Sacramento River WTP beyond 160 mgd would incur high costs and create a major disturbance in a developed urban area.
7. Freeport Diversion	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract. The southern location is disadvantageous and costly for delivering water to PCWA's service area in Placer County. Construction of facilities and pipelines would create a major disturbance in a developed urban area. Coordination with the Freeport Regional Water Authority is required.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to SSWD's service area north of the American River. Coordination with the Freeport Regional Water Authority is required. SSWD will not develop a diversion at this location without PCWA.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to Roseville's service area in Placer County. Construction of facilities and pipelines would create a major disturbance in a developed urban area. Coordination with the Freeport Regional Water Authority is required. Roseville will not develop a diversion at this location without PCWA.	NO	The southern location is disadvantageous for delivering water to north of the American River where primary future demands were identified. In addition to higher costs, construction of facilities and pipelines would create a major disturbance in a developed urban area. Coordination with the Freeport Regional Water Authority is required.
8. Sacramento River from American River confluence to Freeport	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract. The southern location is disadvantageous and costly for delivering water to PCWA's service area in Placer County. Construction of facilities and pipelines would create a major disturbance in a developed urban area.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to SSWD's service area north of the American River. SSWD will not develop a diversion at this location without PCWA.	NO	Reclamation must approve an exchange agreement with PCWA to exchange PCWA's MFP delivery to Folsom Lake for a CVP delivery from the Sacramento River, or the SWRCB must approve an additional point of diversion for PCWA's MFP water rights. The southern location is disadvantageous and costly for delivering water to Roseville's service area in Placer County. Construction of facilities and pipelines would create a major disturbance in a developed urban area. Roseville will not develop a diversion at this location without PCWA.	NO	The southern location is disadvantageous for delivering water to north of the American River where primary future demands were identified. In addition to higher costs, construction of facilities and pipelines would create a major disturbance in a developed urban area.

THIS PAGE LEFT BLANK INTENTIONALLY

Table 6-1. Preliminary Screening of Measures by Cost-Sharing Partner (Cont'd)

Measure	Major Considerations of Institutional Requirements and Constructibility by Cost-Sharing Partner							
	PCWA		SSWD		Roseville		Sacramento	
	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations	Retained?	Summary of Considerations
9. Fairbairn WTP	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract. Due to its urban location, further expansion of the Fairbairn WTP beyond 200 mgd would incur high costs and create a major disturbance in a developed urban area. This location would incur additional facility costs and provides no apparent advantages compared with PCWA's current diversion points at Folsom Dam (for CVP and MFP delivery) and at ARPS (for MFP delivery).	NO	The SWRCB must approve an additional point of diversion for PCWA's MFP water rights. This location would incur additional facility costs and would provide no apparent advantages compared with SSWD's current diversion point at Folsom Dam.	NO	This measure is not consistent with Roseville's Water Forum PSA to limit diversions from the American River.	NO	This measure is not consistent with Sacramento's Water Forum PSA to limit diversions from the American River.
10. American River from Nimbus Dam to confluence with Sacramento River	NO	Reclamation must approve a change in points of delivery for PCWA's CVP contract. This location would incur additional facility costs and would provide no apparent advantages compared with PCWA's current diversion points at Folsom Dam (for CVP and MFP delivery) and at ARPS (for MFP delivery).	NO	The SWRCB must approve the additional point of diversion for PCWA's MFP water rights. This location would incur additional facility costs and would provide no apparent advantages compared with SSWD's current diversion point at Folsom.	NO	This measure is not consistent with Roseville's Water Forum PSA to limit diversions from the American River.	NO	This measure is not consistent with Sacramento's Water Forum PSA to limit diversions from the American River.
11. Folsom Dam	YES	This location is the current authorized point of delivery for PCWA's CVP entitlements.	YES	This location is the current diversion point for SSWD, using shoulder capacity of SJWD's facility. The SWRCB must amend PCWA's MFP water rights to allow additional diversions in non-wet years from this location.	NO	This measure is not consistent with Roseville's Water Forum PSA to limit diversions from the American River.	NO	This measure is not consistent with Sacramento's Water Forum PSA to limit diversions from the American River.
12. ARPS	YES	This location is the current authorized point of diversion under PCWA's MFP water right permits. PCWA must have MFP contractors divert its CVP entitlements at Folsom Dam in lieu of MFP delivery to divert its MFP water at this location.	NO	The location is a currently authorized point of diversion under PCWA's MFP water right permits. The SWRCB must amend PCWA's MFP water rights to allow additional diversions in non-wet years from this location. This location would incur additional facility costs and would provide no apparent advantages compared with SSWD's current diversion point at Folsom Dam.	NO	This measure is not consistent with Roseville's Water Forum PSA to limit diversions from the American River.	NO	This measure is not consistent with Sacramento's Water Forum PSA to limit diversions from the American River.

THIS PAGE LEFT BLANK INTENTIONALLY

PRELIMINARY ALTERNATIVES

In addition to the No-Project/No-Action Alternative, five preliminary action alternatives, listed below were identified based on an initial assessment of measures. Retained measures were combined to address the planning objectives fully, and satisfy the identified planning criteria and constraints.

- Elkhorn/Elverta Diversion Alternative
- Sankey Diversion Alternative
- Feather River Diversion Alternative
- ARPS Alternative
- Folsom Dam Alternative

Each action alternative contains a package of water supply infrastructure components, including new or expanded diversions from the Sacramento, Feather, or American rivers, and new or expanded water treatment and pumping facilities, storage tanks, and major transmission and distribution pipelines.

Among these action alternatives, the Elkhorn/Elverta Diversion Alternative is the only alternative that can accommodate all cost-sharing partners in a comprehensive plan with a single diversion. In other action alternatives, cost-sharing partners share facilities to a greater or lesser degree. A summary description of each preliminary alternative is provided below; more details are available in the **2004 SRWRS Phase 1 Engineering Report**.

Elkhorn/Elverta Diversion Alternative

This proposed project (see **Figure 6-2**) encompasses constructing a joint diversion from the Sacramento River and treatment facilities to serve the cost-sharing partners. The diversion facility would consist of expanding the existing Elkhorn Diversion owned by NMWC on the east bank of the Sacramento River, or constructing a new diversion near Elverta Road, within 2 miles upstream of the existing Elkhorn Diversion. The infrastructure plan of the Elkhorn/Elverta Diversion Alternative includes a raw water intake and pump station located on the Sacramento River, a new joint WTP of the same capacity, raw water pipelines, and treated water pipelines to the connecting point(s) of each cost-sharing partner's existing water distribution system. It is anticipated that the intake and WTP would be owned and operated by Sacramento.

Sankey Diversion Alternative

A Sankey Diversion alternative (see **Figure 6-3**) assumes that PCWA, SSWD, and Roseville would divert water from the Sacramento River near the confluence of the Sacramento River and the NCC, and build separate treatment, storage, and transmission facilities to meet their needs. This new diversion would be located at or near the second diversion that NMWC is developing under its CALFED-supported ABFSHIP. Sacramento would divert separately from the Sacramento River at the Elkhorn/Elverta site through a new intake, and construct its own treatment and transmission facilities to serve its needs.

Feather River Diversion Alternative

A Feather River Diversion Alternative (see **Figure 6-4**) assumes that PCWA, SSWD, and Roseville would divert water from the Feather River near Nicolaus through a new diversion and build separate treatment, storage, and transmission facilities to meet their needs. The CVP would not be able to supply water directly to any diversion location on the Feather River and thus, a further agreement with the SWP and possibly a modification to the COA would be required for this alternative. Sacramento would divert separately from the

Sacramento River at the Elkhorn/Elverta site through a new intake, and construct its own treatment and transmission facilities to serve its needs.

ARPS Alternative

An ARPS alternative (see **Figure 6-5**) assumes that PCWA would expand its ARPS near Auburn,[19] expand its Foothill Phase II WTP[20] with a like capacity increment, and expand transmission facilities to serve its needs. The CVP would not be able to provide a reliable water supply to PCWA at this location and thus, PCWA would divert from its MFP water rights. PCWA's CVP contract entitlement would be diverted at Folsom Dam by SSWD, Roseville, or SJWD in lieu of MFP water delivery.

SSWD would divert from existing SJWD diversion facilities at Folsom Dam using shoulder capacity. Roseville would increase use of groundwater to satisfy its needs for this alternative, but would have no additional surface water diversions. Sacramento would divert separately from the Sacramento River at the Elkhorn/Elverta site through a new intake, and construct its own treatment and transmission facilities to serve its needs.

Folsom Dam Alternative

A Folsom Dam alternative (see **Figure 6-6**) assumes that PCWA and SSWD would use the existing or expanded diversion, treatment, and transmission facilities of SJWD at Folsom Dam. Roseville would increase use of groundwater to satisfy its needs in this alternative, but not have any additional surface water diversions. Sacramento would divert separately from the Sacramento River at the Elkhorn/Elverta site through a new intake, and construct its own treatment and transmission facilities to serve its needs.

[19] The ARPS is currently under construction and will have a diversion capacity of 100 cfs. It is anticipated that construction will be completed in 2007.

[20] As a separate effort, PCWA is currently evaluating the feasibility of a new water treatment facility in the Auburn area for its approved diversions from the American River and PG&E canal system. It is anticipated that the associated environmental review process will be completed in 2005.

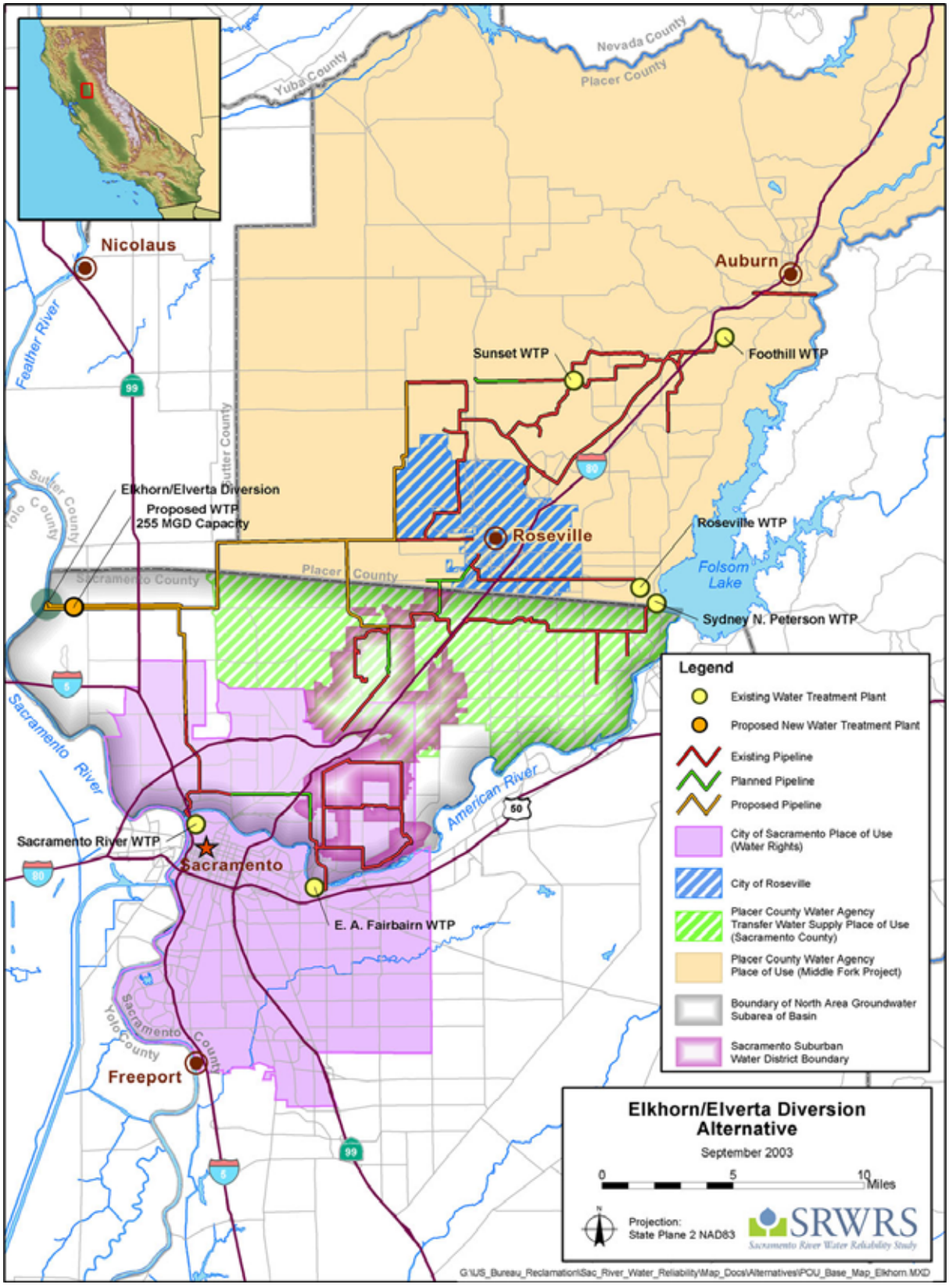


Figure 6-2. Preliminary Alternative: Elkhorn/Elverta Diversion Alternative

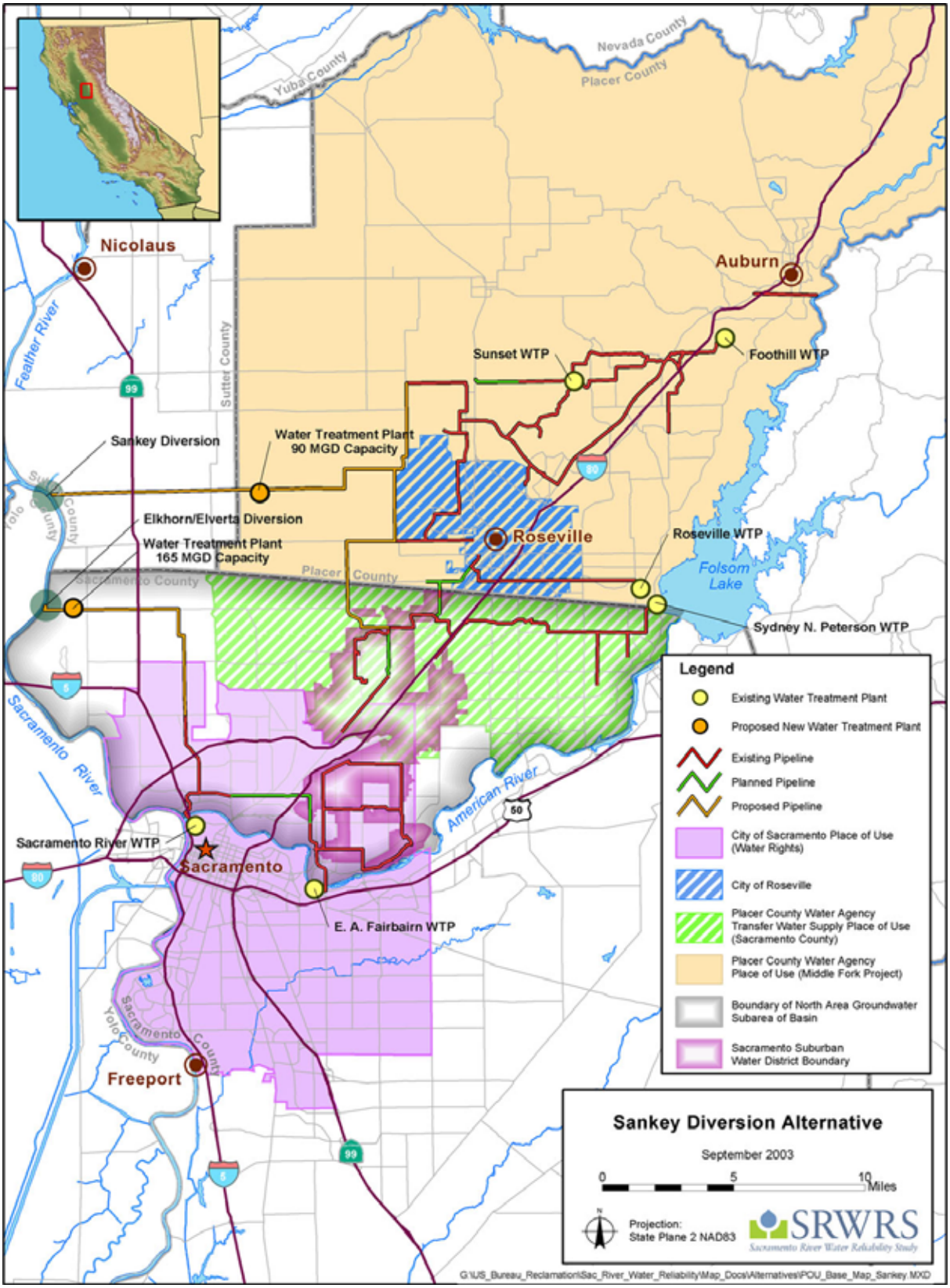


Figure 6-3. Preliminary Alternative: Sankey Diversion Alternative

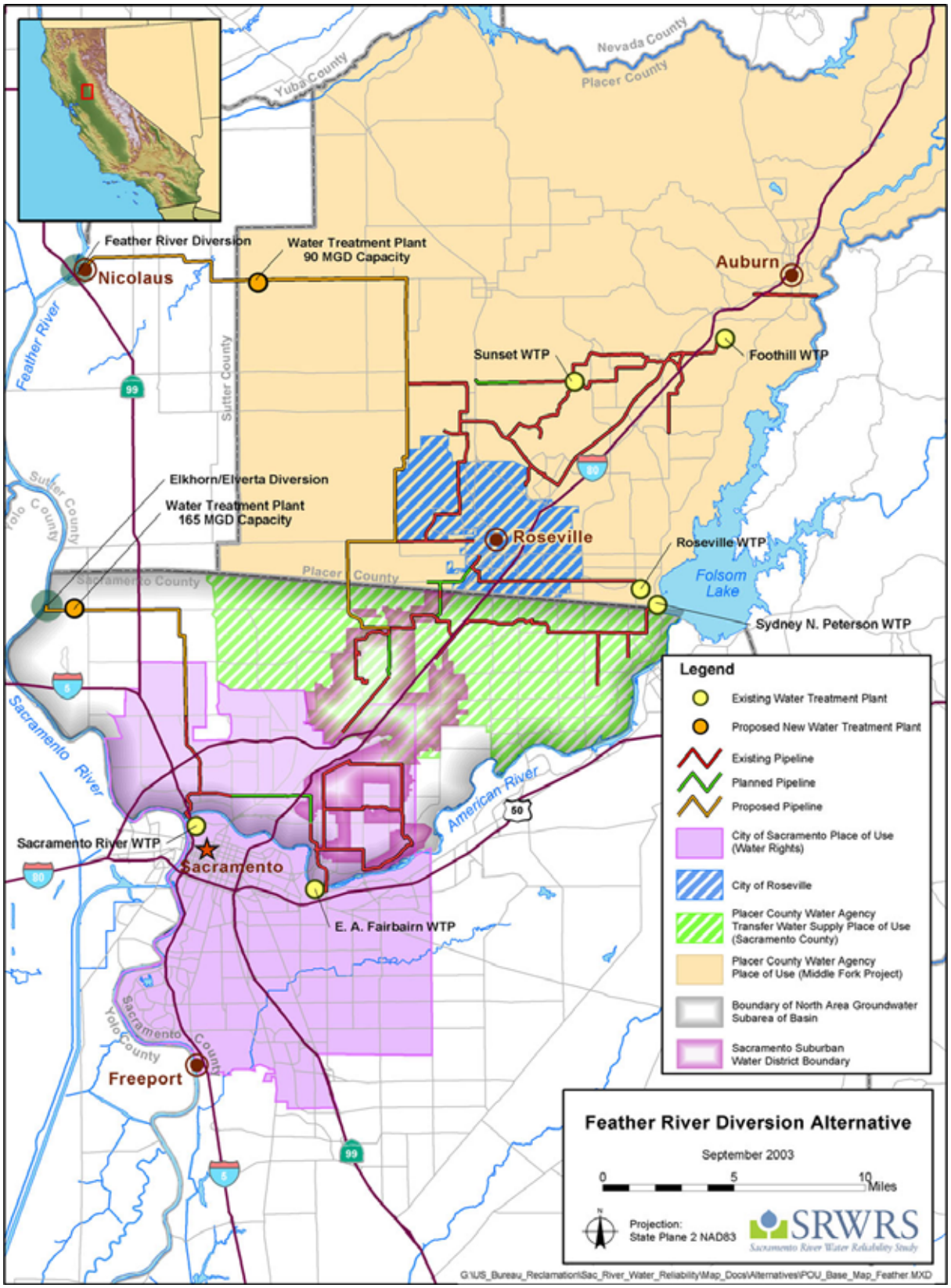


Figure 6-4. Preliminary Alternative: Feather River Diversion Alternative

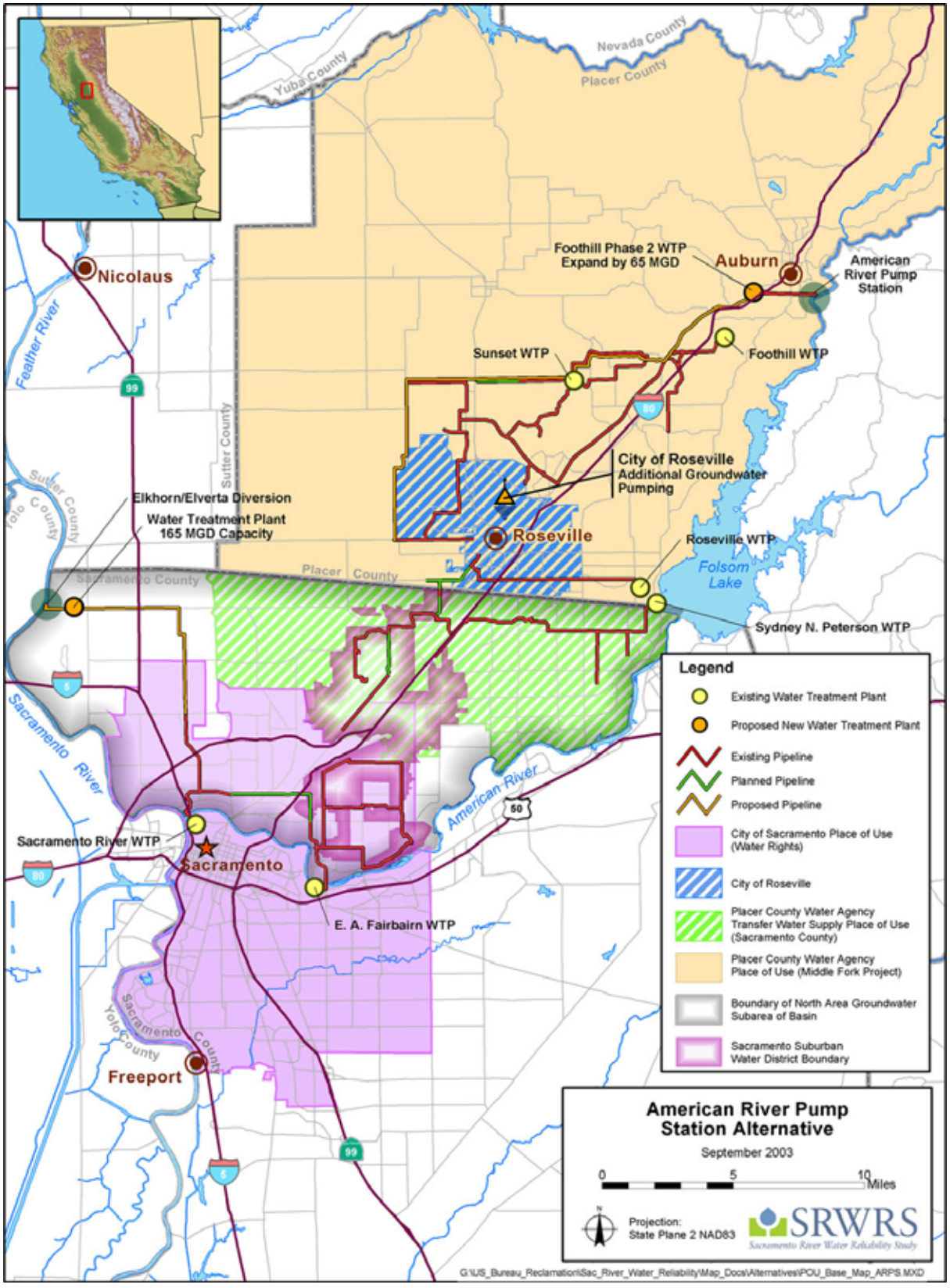


Figure 6-5. Preliminary Alternative: ARPS Alternative

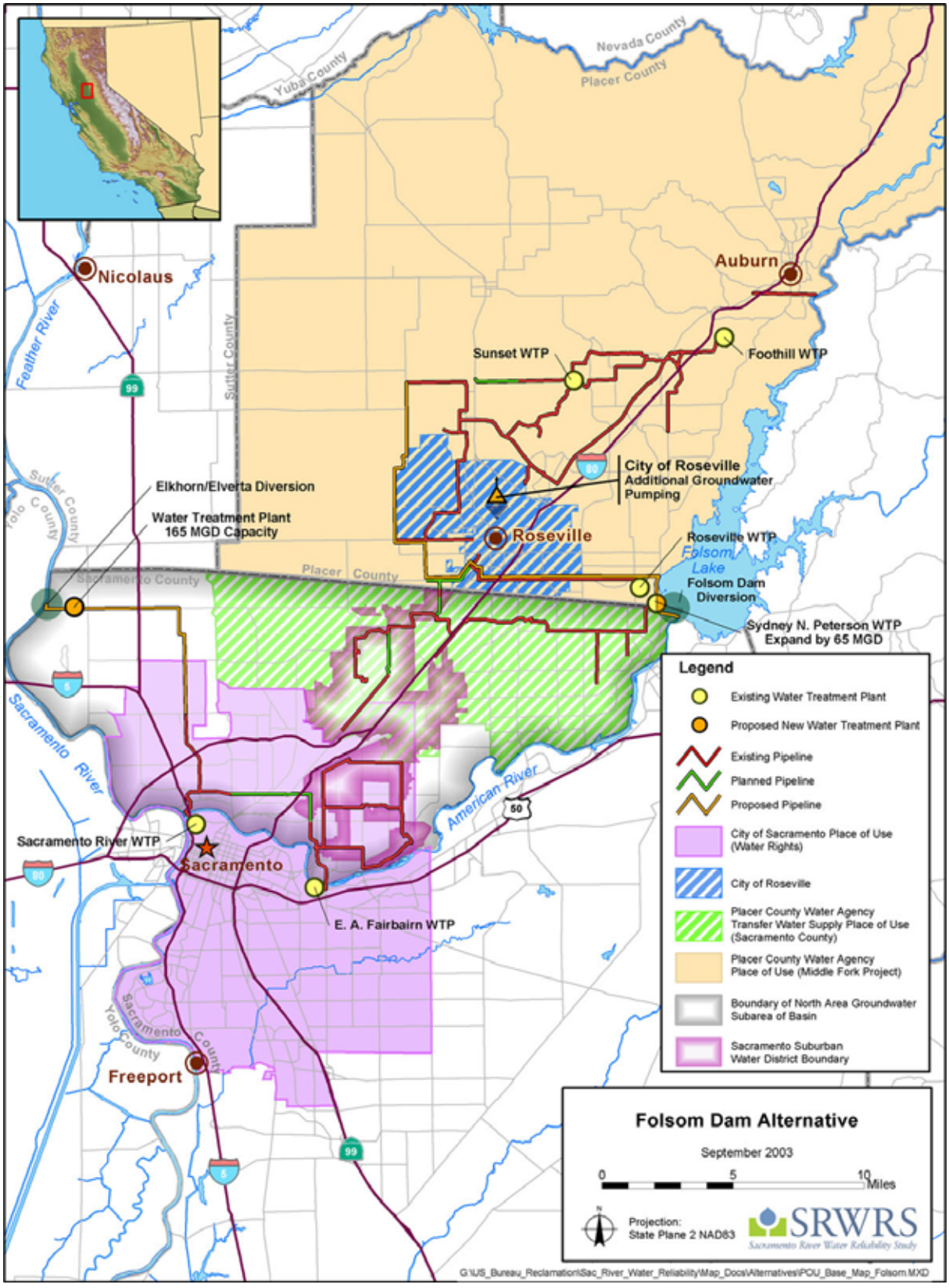


Figure 6-6. Preliminary Alternative: Folsom Dam Alternative

THIS PAGE LEFT BLANK INTENTIONALLY

CHAPTER 7. COMPARISON OF PRELIMINARY ALTERNATIVES

While all preliminary alternatives meet the identified planning objectives completely, and satisfy the planning criteria and constraints effectively, the efficiency and acceptability of these preliminary alternatives varies. SRWRS development can be more focused if the preliminary alternatives are modified, combined, or removed based on findings from initial analyses and public input received during the scoping process.

This chapter describes the results of initial analyses comparing preliminary alternatives and the comments received on the preliminary alternatives during public scoping, and recommends alternatives for further study.

INITIAL ANALYSES OF PRELIMINARY ALTERNATIVES

Initial analyses of institutional requirements, engineering considerations, and environmental considerations were conducted to further assess the feasibility of the preliminary alternatives.

- **Institutional Requirements**. Analysis was conducted as part of the measure screening in **Chapter 6**, including considerations of the need for modifications to existing water rights and contract entitlements, and/or additional operational agreements with entities other than Reclamation and cost-sharing partners. Findings are summarized in **Table 7-1**.

- **Engineering Considerations.** Analysis included engineering definitions of the extent and description of the key elements, potential challenges, and a preliminary cost estimation (opinion of cost) for each preliminary alternative. Details are discussed in the **2004 SRWRS Phase 1 Engineering Report** (included in **Appendix C**) and summarized in **Table 7-2**.

  Note that the initial engineering evaluation suggests that the Elverta location is superior to the Elkhorn location for an M&I diversion because it is located in a deeper channel section, which could facilitate a pier-type diversion with screens on both sides to increase operational efficiency. Therefore, the summary of results in this chapter for the Elkhorn/Elverta diversion alternative was based on diverting from the Elverta location.

- **Environmental Considerations.** Analysis included consideration of the anticipated magnitudes of effect on the environment, and consequent mitigation requirements, and recommended modifications to the preliminary alternatives based on known environmental conditions to reduce potential impacts. Details are discussed in the **SRWRS Phase 1 Environmental Evaluation** (included in **Appendix D**), and summarized in **Table 7-3**.

Table 7-1. Summary of Initial Analyses: Institutional Considerations

Major Institutional Considerations and Requirements	Relative Level of Difficulty by Preliminary Alternative				
	Elkhorn/Elverta Diversion Alternative	Sankey Diversion Alternative	Feather River Diversion Alternative	ARPS Alternative	Folsom Dam Alternative
Reclamation Decisions	**Medium**	**Medium**	**High**	**Low**	**Low**
▪ Approval for adding a Sacramento River location for PCWA's CVP delivery	Yes	Yes	-	-	-
▪ Approval for exchanging MFP water on the American River and CVP delivery on the Sacramento River for diversions by SSWD and Roseville	Yes	Yes	-	-	-
▪ Modifications to the COA through coordination with the SWP for PCWA's CVP delivery, and exchanged deliveries to SSWD and Roseville	-	-	Yes	-	-
SWRCB Decisions	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**
▪ Approval for Sacramento to add the diversion location to its water rights permits	Yes	Yes	Yes	Yes	Yes
▪ Modifications to MFP water rights to allow non-wet year diversions for SSWD from Folsom Dam	-	-	-	Yes	Yes
Major Additional Local Agreements/Coordination	**Medium**	**Medium**	**Medium**	**Medium/High**	**High**
▪ Agreements with the Water Forum Successor Effort on changes in diversions from the American River for PCWA and SSWD	-	-	-	Yes	Yes
▪ Additional agreements with SJWD to use a portion of its WTP firm capacity and conveyance facilities for PCWA's diversion	-	-	-	-	Yes
▪ ABFSHIP	Yes	Yes	Yes	Yes	Yes
▪ Sutter County	Yes	Yes	Yes	-	-
▪ Reclamation District 1000	Yes	Yes	Yes	Yes	Yes
▪ Folsom dam raise	-	-	-	-	Yes
▪ Secondary M&I outlet at Folsom Dam for Roseville, SJWD, and City of Folsom	-	-	-	-	Yes

Table 7-2. Summary of Initial Analyses: Engineering Considerations

Major Engineering Considerations	Relative Level of Difficulty by Preliminary Alternative				
	Elkhorn/Elverta Diversion Alternative	Sankey Diversion Alternative	Feather River Diversion Alternative	ARPS Alternative	Folsom Dam Alternative
Engineering Issues	**Medium**	**Medium/high**	**High**	**Low**	**High**
▪ Shallow river depth could limit diversion design	-	-	Yes	-	-
▪ Existing facilities could limit diversion design	-	-	-	-	Yes[1]
▪ Existing facilities could incorporate potential capacity expansion in their original design	-	-	-	Yes[1]	-
▪ Potentially high public disturbance in urban area	-	-	-	-	Yes[2]
▪ Challenging roadway and river crossing	Yes	Yes	Yes	Yes	Yes
▪ Challenging levee crossing	Yes	Yes	Yes	Yes[2]	Yes[2]
▪ Levee setback requirements	-	Yes[3]	-	-	-
▪ Modifications to Folsom Dam facilities	-	-	-	-	Yes[1]
▪ Hilly and rocky terrain	-	-	-	Yes	-
▪ Potentially unfavorable soil at facility sites	Yes	Yes	Yes	Yes[2]	Yes[2]
▪ High water table at construction sites	Yes	Yes	Yes	Yes[2]	Yes[2]
▪ More permit requirements for multiple intakes	-	Yes	Yes	Yes	Yes
Engineering Cost	**Medium**	**Medium**	**High**	**Low**	**Medium/High**
▪ Preliminary estimate of construction cost (without costs of real estate and environmental mitigation)	$495,700,000	$545,700,000	$561,100,000	$433,500,000	$460,900,000 (penstock option; cost increases with other options)
▪ Cost per AF of surface water diversion; based on the above opinion of cost, and assumed 50 years of project life, and rounded to nearest $5 increment	$90	$100	$105	$85	$90 (penstock option; cost increases with other options)

[1] PCWA only
[2] Sacramento only
[3] PCWA, SSWD, and Roseville only

Table 7-3. Summary of Initial Analyses: Environmental Considerations

Major Environmental Considerations	Potential Level of Magnitude of Effect by Preliminary Alternative				
	Elkhorn/Elverta Diversion Alternative	Sankey Diversion Alternative	Feather River Diversion Alternative	ARPS Alternative	Folsom Dam Alternative
Botany and Wildlife	**Low**	**High**	**High/Infeasible**	**Medium/High**	**Medium**
▪ Riparian woodland habitat at intake location	Yes	Yes	Yes	Yes[2]	Yes[2]
▪ Good quality of riparian wetland at intake location	-	-	Yes	-	-
▪ Wetland and vernal pools near WTP facility sites	Yes	Yes	Yes	-	-
▪ Vernal pools near treated water pipelines	Yes	Yes	Yes	Yes	Yes
▪ Affecting similar physical environment at multiple diversion locations	-	Yes	Yes	-	-
▪ Proximity to major wildlife area and preserve with greater potential of terrestrial resource impacts	-	-	Yes[3]	-	-
Fishery and Water Quality	**Medium**	**Medium**	**Medium**	**High**	**High**
▪ High quality of shaded area riverine habitat at diversion locations	-	-	Yes[3]	-	-
▪ Diversion from a migration corridor for anadromous fish	Yes	Yes	Yes	Yes[2]	Yes[2]
▪ Diversion from the American River with higher fishery sensitivity	-	-	-	Yes[4]	Yes[4]
▪ Potential reduction in downstream dilution potential and increased surface water quality parameters of concern	Yes	Yes	Yes	Yes	Yes
Recreation	**Low**	**Medium**	**Low**	**Medium**	**Low**
▪ Protrusion of diversion structure may reduce river recreation experience	Yes	Yes	Yes	-	Yes[2]
▪ Near Feather River Wildlife Area and Bobelaine Ecological Reserve	-	-	Yes	-	-
▪ Within Folsom Lake SRA	-	-	-	-	Yes[1]
▪ Within Auburn SRA	-	-	-	Yes[2]	-
▪ Previous concerns expressed about the facility currently under construction and expansion related to alternatives under consideration				Yes[2]	

Table 7-3. Summary of Initial Analyses: Environmental Considerations (cont'd)

Major Environmental Considerations	Potential Level of Magnitude* of Effect by Preliminary Alternative				
	Elkhorn/Elverta Diversion Alternative	Sankey Diversion Alternative	Feather River Diversion Alternative	ARPS Alternative	Folsom Dam Alternative
Land Use	**Low**	**Low**	**Low**	**Low**	**Low**
▪ Potential conflict between WTP and proposed airport expansion	Yes	Yes[2]	Yes[2]	Yes[2]	Yes[2]
▪ Potential conflict between WTP and nearby residential uses	-	Yes[3]	-	-	-
▪ New pipelines go through established residential areas that may be subjected to significant disruption during construction	-	-	-	-	Yes[1]

* Level of Magnitude:
High/Infeasible = Significant impacts would be infeasible to mitigate
High = Mostly significant effects in one or more resource areas, with significant need for mitigation
Medium = Mostly significant with some less than significant
Low = Mostly less than significant

[1] PCWA only
[2] Sacramento only
[3] PCWA, SSWD, and Roseville only
[4] PCWA and SSWD only

PUBLIC INPUT ON PRELIMINARY ALTERNATIVES AND STUDY DEVELOPMENT

Preliminary alternatives were included in the NOI and NOP issued for the SRWRS scoping process in July and August 2003, respectively. The alternatives were presented in briefings from July through October 2003, and scoping meetings in September 2003 were held to solicit public input on preliminary alternatives and study development.

SRWRS Scoping Report

The scoping process for the SRWRS took place from July through October 2003. Six public scoping meetings and eighteen briefings were conducted in addition to communication through written materials such as an NOI/NOP and Prescoping Discussion.

The Scoping Report documents the scoping process, questions and comments received during the scoping process, and the SRWRS approach to major categories of scoping questions and comments. The report has the following attachments:

- NOI/NOP
- Prescoping Discussion
- Supplemental information from briefings and public scoping meetings

The NOI/NOP and public input received during the scoping process are documented in a **Scoping Report**[21] (included in **Appendix E**). The majority of the scoping comments and questions fit into one of five categories: (1) EIS/EIR issues, (2) compliance with the authorizing legislation, (3) definition of alternatives, (4) coordination with other projects/studies, and (5) water conservation. These comments and questions will be taken into consideration as the SRWRS continues.

Comments related to the feasibility of the preliminary alternatives were consistent with findings in the above-mentioned initial analyses performed for the preliminary alternatives. The public also recommended that the SRWRS coordinate with other ongoing projects/studies through various outreach activities; specifically, the SRWRS shall coordinate with the ABFSHIP, CVP long-term contract renewal, and CVP OCAP consultation. This level of coordination also has been considered critical in the development of SRWRS.

- **Coordination with ABFSHIP**. Coordination between ABFSHIP and the SRWRS is necessary for many reasons:

  - These two projects are included in the WFA and have the same study authorization; Reclamation is the lead agency for both for NEPA compliance.

  - The development schedule for the SRWRS is similar to that for ABFSHIP, despite a 3-year lapse between their corresponding start dates.

  - These two projects include major diversions within a 2-mile reach of the Sacramento River near the Sacramento International Airport.

  - A portion of the Natomas Basin is experiencing a change in land use from agriculture to urbanization. A regional approach for facility development and water management could preserve more flexibility to accommodate future changes in land use plans.

  Potential regional benefits in water management and environmental preservation motivate coordination between ABFSHIP and the SRWRS; this coordination may influence the facility plans under each scenario, as discussed later in this chapter.

- **Coordination with CVP Long-Term Contract Renewal.** Regarding the SRWRS, Long-Term Contract Renewal would provide authority for CVP diversions at Folsom Dam for PCWA and Roseville. CVP contract entitlements are a critical part of PCWA's and Roseville's future water supply plan. With assistance from the cost-sharing partners, water supply conditions developed for the SRWRS can be used to refine Reclamation's needs assessment, which was conducted as part of

[21] SRWRS. 2004. SRWRS Scoping Report.

the contract renewal efforts. Conversely, the renewal efforts will help establish a basis of comparison for environmental review for the SRWRS.

- **Coordination with CVP OCAP Consultation.** The OCAP and associated CVP-SWP joint operation considered in the consultation process covers a complete set of current and future operations and regulatory requirements for the CVP and SWP system, and other local projects and water rights diversions. The recently completed OCAP consultation has resulted in formalized operation and a new environmental baseline for ESA compliance, which would be used for the SRWRS. Similar to coordination with CVP Long-Term Contract Renewal, detailed water need assessments for the cost-sharing partners developed for the SRWRS can provide refined information for the future revision of OCAP and associated consultation needs.

SCREENING OF PRELIMINARY ALTERNATIVES

The five preliminary action alternatives were screened based on public input and results from the aforementioned initial analyses. The purpose of the screening was to provide additional focus in continued SRWRS development by removing/adding/combining alternatives and project components.

Overall Assessment of Preliminary Alternatives

The Feather River Diversion Alternative is the only preliminary alternative on this river. It compared unfavorably with other alternatives in all aspects considered in initial analyses. First, it is likely to create significant environmental impacts on botanic and wildlife resources that may not be feasible to mitigate. Also, a significant involvement by the SWP would be required to facilitate planned diversions, resulting in additional institutional difficulties. Lastly, unfavorable engineering conditions at the diversion location would render a less efficient and sediment-prone design.

On the Sacramento River, the Sankey Diversion Alternative has no advantages compared with the Elverta Diversion Alternative due to its higher cost, greater environmental impacts due to two water supply systems, and required coordination with ABFSHIP for two diversions instead of one. In addition, having major water supply facilities in Sutter County is a disadvantage for PCWA, Roseville, and SSWD because their service areas are within Placer and Sacramento counties.

On the American River, comparison of the ARPS and Folsom Dam alternatives has mixed results. Institutional requirements for these two alternatives are similar. The ARPS alternative appears to be the least-cost alternative, but it may have a high level of effect on the environment compared with the Folsom Dam Alternative. The Folsom Dam Alternative would be the most difficult to construct. In addition, the Folsom Dam Alternative could require significant coordination with major structural modifications/improvements of Folsom Dam that are either scheduled for implementation or currently under study, which would be a significant disadvantage considering the planning objective of completing the SRWRS selected plan by 2010.

Therefore, after considering all factors, the following preliminary alternatives were removed from further study:

- Feather River Diversion Alternative
- Sankey Diversion Alternative
- Folsom Dam Alternative

Recommended Alternatives for Further Study

Two preliminary action alternatives were retained for further study: the Elkhorn/Elverta Diversion Alternative and ARPS Alternative. These two preliminary action alternatives were further developed into four action alternatives to incorporate considerations for coordination with ABFSHIP on its Sankey/Elkhorn Diversions Alternative for further study development and environmental review. These four retained alternatives are described below (the corresponding facility plans are summarized in **Table 7-4**):

- **SRWRS Elverta Diversion Alternative** (see **Figure 7-1**). This alternative consists of the Elverta Diversion and associated facility plan to accommodate only the needs of the SRWRS cost-sharing partners. The infrastructure plan includes a raw water intake and pump station located on the Sacramento River with a total discharge capacity of 235 mgd, or 365 cfs, a new joint WTP of the same capacity along Elverta Road, raw water pipelines, and treated water pipelines to the connecting point(s) of each cost-sharing partner's existing water distribution system. It is anticipated that the intake and WTP would be owned and operated by Sacramento. Under this alternative, it is assumed that NMWC would construct and operate its Elkhorn Diversion of 136 mgd (210 cfs), planned for ABFSHIP independent of the SRWRS, or continue to divert from their existing diversions.

- **Joint SRWRS-ABFSHIP Elverta Diversion Alternative** (see **Figure 7-2**). This alternative consists of a consolidated diversion on the Sacramento River and associated facility plan to accommodate the needs of the SRWRS cost-sharing partners, and the needs of NMWC from its planned Elkhorn Diversion under ABFSHIP. In other words, in addition to facilities of the SRWRS Elverta Diversion Alternative, this alternative includes an additional diversion capacity of 165 mgd (210 cfs) and landside improvements for accommodating NMWC's needs from the planned Elkhorn Diversion, if the ABFSHIP lead agencies recommend the proposed Sankey/Elkhorn Diversions alternative in their final decision(s). Therefore, the Elkhorn Diversion planned in ABFSHIP would not be constructed.

  No implication about NMWC's existing water rights and contract entitlements was made by proposing a consolidated diversion for the Joint SRWRS-ABFSHIP Elverta Diversion Alternative and this alternative is subject to agreement among local water purveyors. ABFSHIP would be maintained in a separate study pursued by NMWC to consolidate its existing five agricultural diversions into two for fishery protection and operational efficiency. The SRWRS would consider only facility components and their associated environmental impacts that are necessary to move the planned Elkhorn Diversion to the Elverta location for potential regional benefits.

- **ARPS-Elverta Diversion Alternative** (see **Figure 7-3**). Under this alternative, PCWA would expand its ARPS near Auburn from a capacity of 100 cfs to 200 cfs; expand its Foothill Phase II WTP with an increment of like capacity; and expand its associated transmission facilities. SSWD would divert from SJWD's existing diversion facilities at Folsom Dam using shoulder capacity. Roseville would increase use of groundwater to satisfy its needs under this alternative, but would have no additional surface water diversions. Sacramento would divert separately from the Sacramento River at the Elverta site through a new intake of 145 mgd (235 cfs), and construct its own treatment and transmission facilities to serve its needs. Under this alternative, NMWC would construct and operate its planned Elkhorn Diversion of 136 mgd (210 cfs) independent of the SRWRS, or continue to divert from their existing diversions.

- **ARPS-Joint Sacramento-ABFSHIP Elverta Diversion Alternative** (see **Figure 7-4**). This alternative would have the same facilities as for the ARPS-Elverta Diversion Alternative, an additional diversion capacity of 165 mgd (210 cfs), and landside improvements for accommodating NMWC's needs from the planned Elkhorn Diversion, if the ABFSHIP lead agencies recommend the proposed Sankey/Elkhorn Diversions alternative in their final decision(s).

  Similar to the Joint SRWRS-ABFSHIP Elverta Diversion Alternative, no implication about NMWC's existing water rights and contract entitlements was made by proposing a consolidated diversion for

Sacramento and ABFSHIP and this alternative is subject to agreement among local water purveyors. ABFSHIP would be maintained in a separate study pursued by NMWC to consolidate its existing five agricultural diversions into two for fishery protection and operational efficiency. The SRWRS would consider only facility components and their associated environmental impacts that are necessary to move the planned Elkhorn Diversion to the Elverta location for potential regional benefits.

Note that the development of ABFSHIP is independent to SRWRS development. The final Federal decision(s) on ABFSHIP has not been made. The above description of retained alternatives with a consolidated diversion (Joint SRWRS-ABFSHIP Elverta Diversion Alternative and ARPS-Joint Sacramento-AFSHIP Elverta Diversion Alternative) assumes the condition of the ABFSHIP-proposed action under its ASIP process, which would allow the opportunity for a consolidated diversion. If the final Federal decision(s) on ABFSHIP indicates otherwise, these alternatives would be reduced to their corresponding counterpart without the consolidation feature (i.e., SRWRS Elverta Diversion Alternative and ARPS-Elverta Diversion Alternative, respectively).

Table 7-4. Summary of Facility Plans for Alternatives Retained for Further Study

Alternative	Purveyor	SRWRS Facility Plan for Diversions Under Consideration[1]						Corresponding ABFSHIP Elkhorn Diversion Capacity (listed for reference only)	
		Diversion			Treatment Capacity (mgd)	Transmission Pipelines	Canal Improvement		
		Location	Capacity Increment (cfs)	Capacity Increment (mgd)				(cfs)	(mgd)
SRWRS Elverta Diversion Alternative	PCWA	Elverta	101	65	65	Connecting to distribution systems	Relocation near diversion		
	SSWD	Elverta	23	15[2]	15[2]				
	Roseville	Elverta	16	10	10				
	Sacramento	Elverta	225	145	145				
	NMWC	-	-	-	-	-	-	210	136
	Subtotal for Elverta		**365**	**235**	**235**				
Joint SRWRS-ABFSHIP Elverta Diversion Alternative	PCWA	Elverta	101	65	65	Connecting to distribution systems	Relocation near diversion		
	SSWD	Elverta	23	15[2]	15[2]				
	Roseville	Elverta	16	10	10				
	Sacramento	Elverta	225	145	145				
	NMWC	Elverta	210	136	-	-	As needed for ensuring operation	-	-
	Subtotal for Elverta		**575**	**371**	**235**				
ARPS-Elverta Diversion Alternative	PCWA	ARPS	101	65	65	Connecting to distribution systems	-		
	SSWD	Folsom Dam	23	-[3]	-[3]				
	Roseville	------ *Use existing groundwater capacity* -----							
	Sacramento	Elverta	225	145	145		Relocation near diversion		
	NMWC	-	-	-	-	-	-	210	136
	Subtotal for Elverta		**225**	**145**	**145**				
ARPS-Joint Sacramento-ABFSHIP Elverta Diversion Alternative	PCWA	ARPS	101	65	65	Connecting to distribution systems	-		
	SSWD	Folsom Dam	23	-[3]	-[3]				
	Roseville	----- *Use existing groundwater capacity* -----							
	Sacramento	Elverta	225	145	145		Relocation near diversion		
	NMWC	Elverta	210	136	-		As needed for ensuring operation	-	-
	Subtotal for Elverta		**435**	**281**	**155**				

[1] All SRWRS facility plans would provide the following water rights and contract entitlements:

- PCWA's 35,000 AF per year CVP contract entitlement
- SSWD's 29,000 AF per year PCWA's MFP contract entitlement in Water Forum non-wet years
- Roseville's diversions of up to 7,100 AF per year PCWA's MFP contract entitlement
- Sacramento's diversions from 245,000 AF per year American River water rights and 81,800 AF per year Sacramento River water rights beyond the capacity of the Sacramento River and Fairbairn WTPs, while observing WFA limitations on diversion at the Fairbairn WTP.

[2] SSWD also would use additional shoulder capacity for delivery of up to 29,000 AF per year.

[3] SSWD also would use existing shoulder capacity at SJWD's Peterson WTP for delivery of up to 29,000 AF per year.

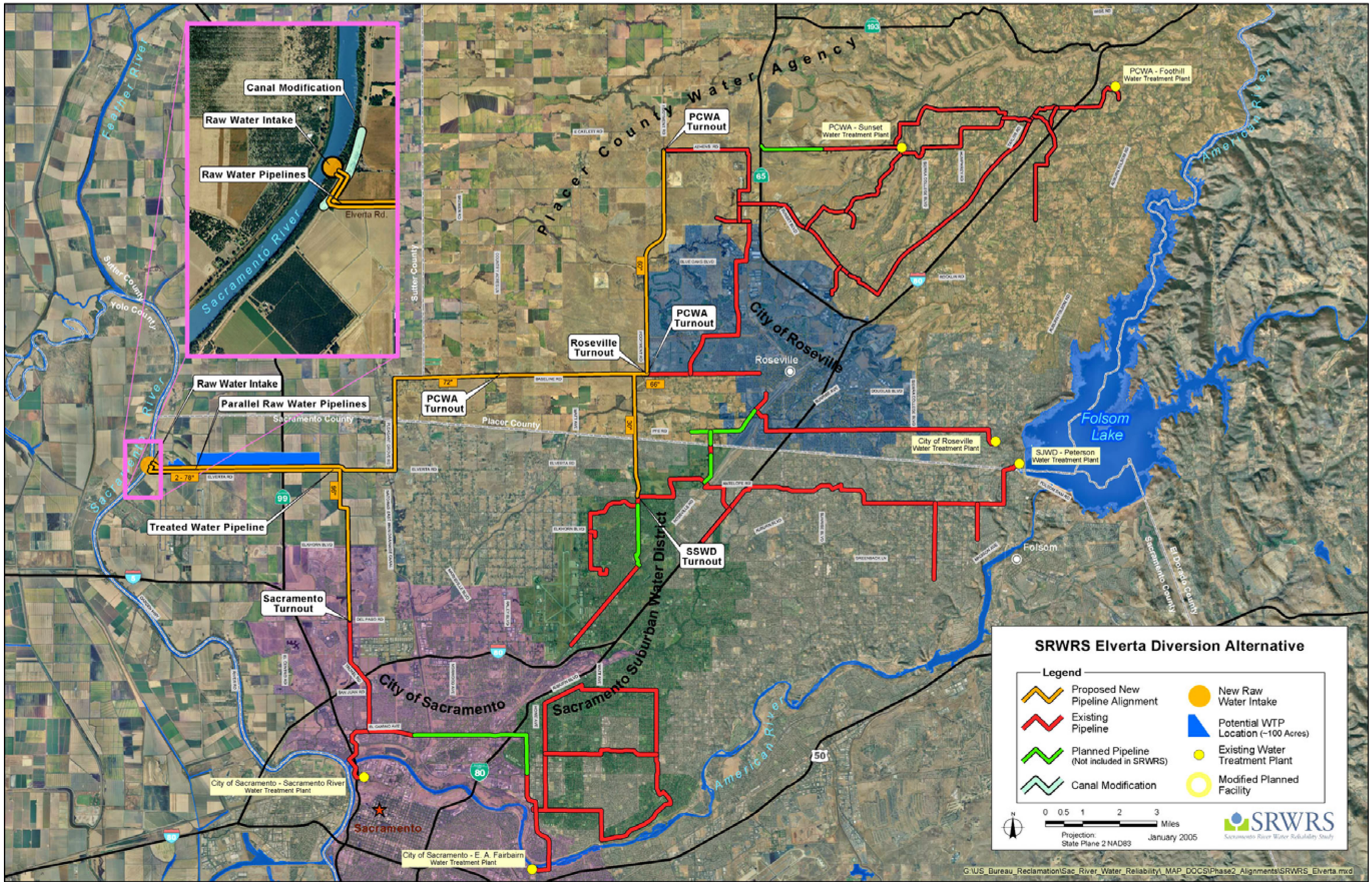


Figure 7-1. SRWRS Elverta Diversion Alternative

THIS PAGE LEFT BLANK INTENTIONALLY

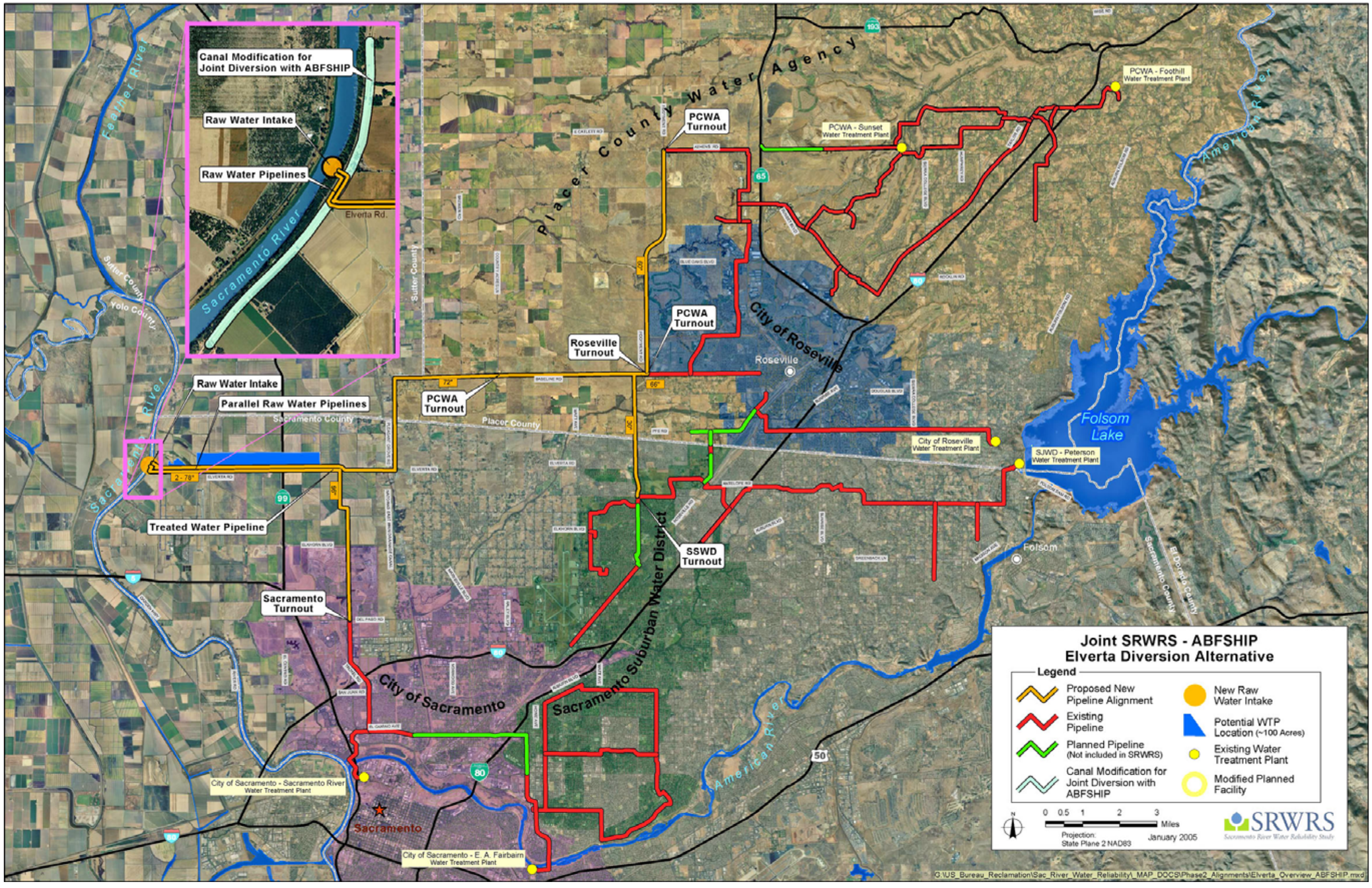


Figure 7-2. Joint SRWRS-ABFSHIP Elverta Diversion Alternative

THIS PAGE LEFT BLANK INTENTIONALLY

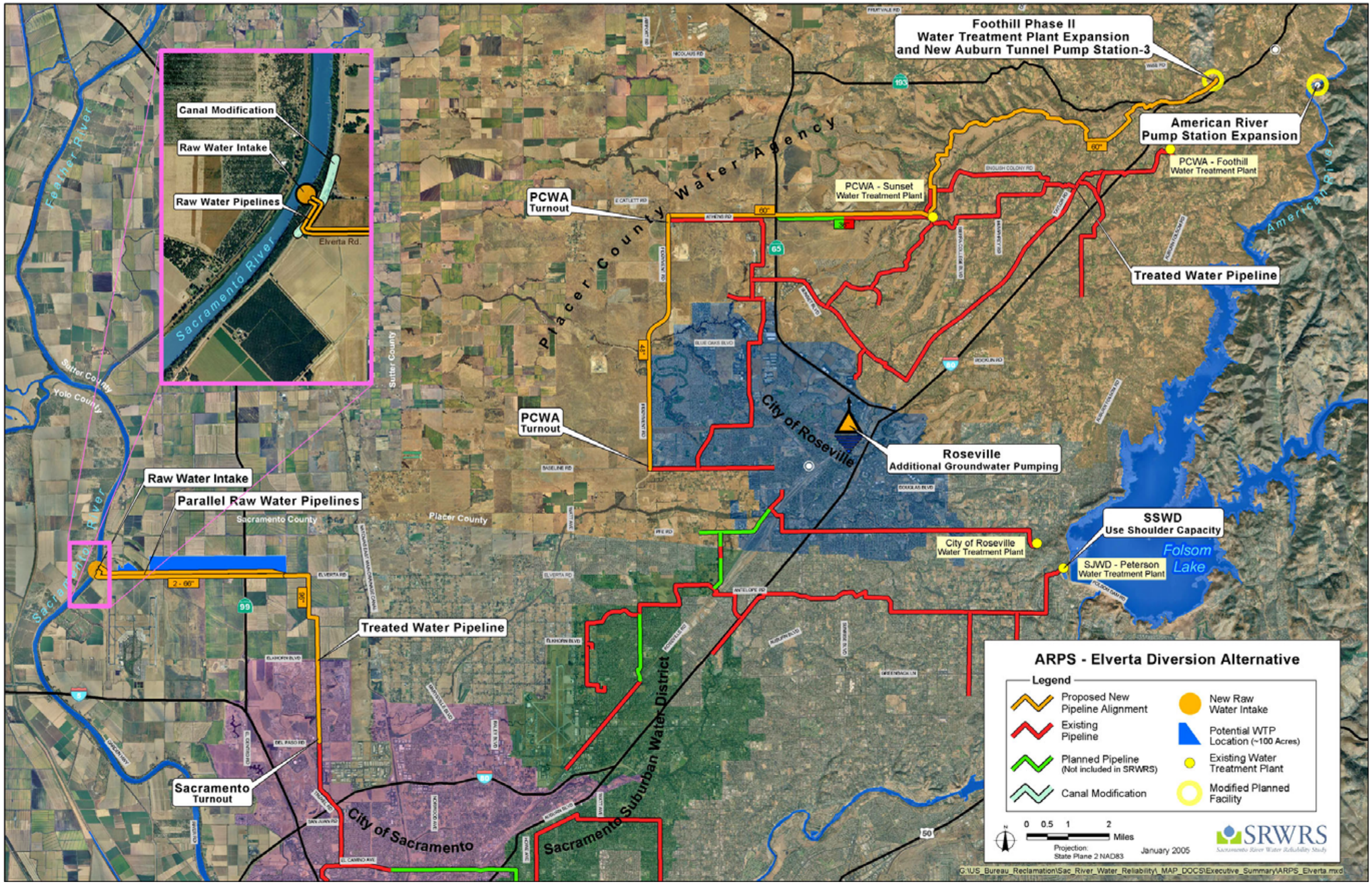


Figure 7-3. ARPS-Elverta Diversion Alternative

THIS PAGE LEFT BLANK INTENTIONALLY

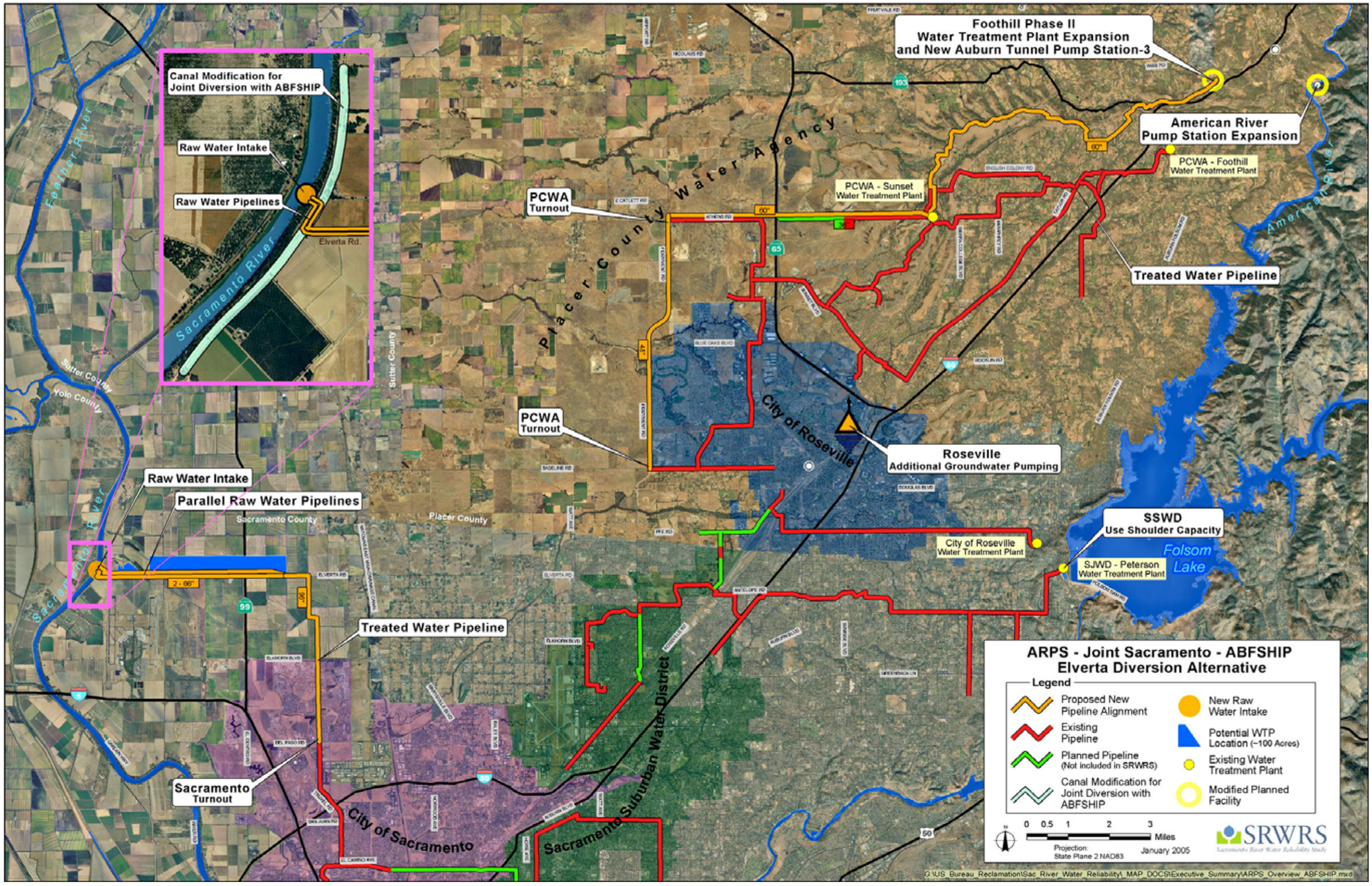


Figure 7-4. ARPS-Joint Sacramento-ABFSHIP Elverta Diversion Alternative

THIS PAGE LEFT BLANK INTENTIONALLY

CHAPTER 8. NEXT STEPS IN SRWRS DEVELOPMENT

This chapter summarizes next steps, challenges, and tentative schedule for continued development of the SRWRS.

CONTINUED DEVELOPMENT OF THE SRWRS

The SRWRS has completed the first two phases of plan formulation, namely, Initial Analysis Phase and Initial Plans Phase. During these two phases, the first four of six steps in SRWRS development were completed, as described in **Chapter 5**:

1. Identifying the existing resource conditions and future water supply reliability needs (without implementation of a project) of each cost-sharing partner

2. Defining water resources problems and opportunities to be considered in the SRWRS

3. Developing objectives for formulating alternatives and associated planning criteria and constraints

4. Formulating potential solutions (alternatives) to meet the identified objectives while satisfying the planning criteria and constraints

The SRWRS also has developed and implemented a strategic plan for public outreach and involvement during study development. The public was able to participate through individual briefings, study updates at major milestones, information posted on the project Web site, and individual communications.

Next Steps

In the remaining two phases of plan formulation (Alternative Plans Phase and Recommended Plan Phase), development of the SRWRS will focus on actions related to the last two of the six steps:

5. Evaluating and comparing potential effects of these alternatives, including accomplishments in meeting objectives, resulting water supply and environmental impacts, and economic considerations

6. Recommending a plan for implementation based on comparing the alternatives

Refining findings and public outreach and involvement, as in the previous four steps, would continue during the last two steps to ensure overall consistency and integrity. Tasks to be performed during the current Alternative Plans Phase will include the following:

- Evaluating alternatives for accomplishments in meeting the planning objectives

- Refining engineering design for each retained alternative

- Assessing environmental impacts and economic considerations for each retained alternative

- Preparing BAs and a draft PR/EIS/EIR

- Continuing public outreach through newsletters, briefings, workshops, and other activities

- Selecting a preferred plan and finalize PR/EIS/EIR with recommended actions

In the final phase of SRWRS development, the Recommended Plan Phase, efforts will be made to complete ESA consultation, continue public involvement and agency coordination, and finalize a PR/EIS/EIR. The technical information developed will be used for decisions associated with the preferred alternative. These decisions include, but are not limited to, a Federal ROD for the SRWRS and separate resolutions of the cost-sharing partners, necessary contract amendments and/or exchange agreements between cost-sharing partners and Reclamation, and permits necessary for diversion and/or construction from SWRCB and other regulatory agencies.

List of Key Agencies for Study Coordination

California Department of Boating
California Department of Fish and Game
California Department of Transportation
California Environmental Protection Agency
California Reclamation Board
Natural Resources Conservation Service
NOAA Fisheries
Reclamation District 1000
Sacramento Area Flood Control Agency
State Lands Commission
State Historic Preservation Office
State Water Resources Control Board
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

Potential Federal Role in Project Implementation

The preliminarily findings of SRWRS indicates that local water purveyors are potential beneficiaries of a Sacramento River diversion, but that Reclamation's potential interest in a Sacramento River diversion is limited because this region has sufficient water rights and contract entitlements to meet projected future demand. However, a Sacramento River diversion could promote other Federal interests that could be realized in other ongoing programs and projects, as described in **Chapter 4**.

Considering limited Federal interest in water supply plans evaluated in the SRWRS, the cost-sharing partners have requested Reclamation to consider the following Federal administrative actions for implementing a Sacramento River diversion:

- Including an additional point of delivery at the selected Sacramento River location in PCWA's CVP contract for delivery of up to 35,000 AF per year

- Entering into an exchange agreement with PCWA to receive water released from the MFP to Folsom Lake, and to provide an equal amount of water for SSWD's and Roseville's diversions at the selected Sacramento River location

Note that constructing a Sacramento River diversion for Sacramento to divert its senior water rights on the Sacramento River does not require Reclamation approval or actions.

The aforementioned Federal actions are within the delegated authority of a regional director and require no subsequent or additional authorization from Congress. However, if deemed beneficial, implementation of the joint SRWRS-ABFSHIP Elverta Diversion Alternative would require additional Federal decisions on consolidating diversion capacity of a Federally supported project with a local diversion project. This particular action may require additional congressional authorization. Therefore, continued consideration of potential Federal involvement in project implementation is recommended.

CHALLENGES IN THE CURRENT PHASE OF SRWRS DEVELOPMENT

Challenges exist in the current Alternative Plans Phase for all aspects of SRWRS development, including institutional, engineering, environmental, and public outreach. Primary challenges fit in three categories:

- Coordinating with the ABFSHIP

- Determining baseline conditions and associated environmental impact assessments

- Complying with authorizing legislation

Coordination with ABFSHIP

Coordinating with ABFSHIP is a necessary component of the SRWRS due to the close vicinity of planned diversions for these two projects. During the SRWRS scoping process, the public also stressed the importance of coordinating development and reducing confusion in purposes and plans associated with these two projects.

ABFSHIP is currently preparing environmental documentation and has recently completed the final design for consolidating five existing agricultural diversions along the Sacramento River into two diversions. With the earliest implementation date in 2005, implementation of ABFSHIP would be staged by focusing on construction of the Sankey Diversion first if funding is not fully available.

It is anticipated that implementing the plan recommended in the SRWRS would be financed by locals without expectation of Federal funding. Possible earlier implementation in this scenario would allow the opportunity of constructing a consolidated diversion if deemed beneficial to environment and regional planning.

The format of coordination between the SRWRS and ABFSHIP is a result of collaborative efforts among Reclamation, regulatory agencies, and local water purveyors. The major attributes of this coordination are summarized as follows:

- The SRWRS and ABFSHIP will maintain independent projects.
- The SRWRS will include alternatives for a consolidated diversion to accommodate SRWRS needs and the ABFSHIP-planned capacity of 165 mgd (210 cfs) at Elkhorn.
- For a consolidated diversion, the SRWRS will include only components necessary to accommodate the function of a 165 mgd (210 cfs) Elkhorn diversion. The purpose of NMWC's capacity needs and diversion requirements, planned Sankey and Elkhorn diversions, and other canal improvements will not be evaluated in the SRWRS.

Before deciding on the merit of a consolidated diversion, regulatory agencies would evaluate the benefits of a consolidated, joint SRWRS-ABFSHIP diversion when information becomes available.

Determination of Basis of Comparison for Environmental Impact Assessments

A basis of comparison for environmental impact assessments under NEPA, CEQA, and ESA requirements will be developed through consultation with Reclamation and regulatory agencies. Because of differences in regulation requirements, compliance with these laws could require the SRWRS to develop different bases of comparison for decision-making. Developing these conditions and associated environmental impact assessments is especially challenging for the SRWRS due to the following factors:

- The cost-sharing partners have several ongoing major construction projects; effects of these projects on the environment due to facility construction and operation have been disclosed. Necessary mitigation measures have been identified in environmental documents and associated BOs and construction permits. Projects include the following:
    - Sacramento's expansion of its Fairbairn WTP on the American River and Sacramento River WTP on the Sacramento River below the American River confluence. Expected completion dates for both projects are in 2005.
    - PCWA's construction of a permanent ARPS on the North Fork American River near Auburn. The expected completion date is in 2007.

- Reclamation is currently proceeding with CVP Long-Term Contract Renewal efforts. Progress was furthered by recent completion of the OCAP ESA consultation. Reclamation has recently released the draft documentation for the American River Unit contracts, which are the most relevant to the SRWRS. Relationships between the SRWRS and the Long-Term Contract Renewal efforts and OCAP consultation are summarized as follows:

    - PCWA's CVP contract, considered in the SRWRS, is one of many CVP long-term contracts considered in the American River Unit EIS and OCAP. The assumed point of diversion is at Folsom Dam. Therefore, the EIS developed by the SRWRS is for supporting Reclamation's decision on approval of adding a Sacramento River diversion to PCWA's CVP contract.

    - The Placer-Sacramento region has other CVP contractors, including Roseville, SJWD, SCWA, City of Folsom, SMUD, and NMWC; however, these CVP deliveries are not the focus of surface water development under the SRWRS.

    - Sacramento has water rights on the American and Sacramento rivers that are senior to those of the CVP. Reclamation has a settlement agreement with Sacramento to guarantee Sacramento's diversions of up to 245,000 AF per year from the American River and 81,800 AF per year from the Sacramento River. The priority of water rights would need to be recognized and reflected in the environmental impact assessments. In other words, Sacramento's development of additional surface water supply within its water rights would not require approval from Reclamation.

Compliance with Authorizing Legislation

SRWRS development will fully comply with the authorizing legislation, especially Subsections (a)(5) and (c), which were of particular interest during the scoping process.

Subsection (a)(5)

The authorizing language states the following:

> SEC. 103. (a) IN GENERAL.—The Secretary of the Interior shall conduct a feasibility study for a Sacramento River, California, diversion project that is consistent with the Water Forum Agreement among the members of the Sacramento, California, Water Forum dated April 24, 2000, and that considers—
>
> …
>
> (5) the potential to accommodate other diversions of water from the Sacramento River, subject to additional negotiations and agreement among Water Forum signatories and potentially affected parties upstream on the Sacramento River….

The diversion for Sacramento fully conforms to the WFA. Based on the WFA, Sacramento will take advantage of its unique position of having water rights on both the American and Sacramento rivers to facilitate diversion reduction on the American River during Hodge Flow conditions, and capture forgone diversions from the Sacramento River. Sacramento could have initiated a separate environmental review process for these diversions, but decided to participate in the SRWRS to further enforce the regional approach and collaboration envisioned by the WFA.

The diversion for Roseville from the Sacramento River, although based on exchange of its existing contract entitlements on the American River, is not included in the WFA, and Roseville is currently in discussions with the Water Forum Successor Effort on this issue. Results from the SRWRS will be used to help determine the merits of the proposed diversion for Roseville.

Through continued public outreach activities, the SRWRS will coordinate and communicate with the potentially affected parties upstream on the Sacramento River and beyond. Results of the SRWRS feasibility study and environmental review will be used to strengthen additional negotiations and agreements with the potentially affected parties upstream on the Sacramento River to comply with Subsection (a)(5).

Subsection (c)

The authorizing language states the following:

> (c) Water Supply Impact Alternatives. – The study authorized by this section shall include a range of alternatives, all of which would investigate options that could reduce to insignificance any water supply impact on water users in the Sacramento River watershed, including Central Valley Project contractors, from any delivery of water out of the Sacramento River as referenced in subsection (a). In evaluating the alternatives, the study shall consider water supply alternatives that would increase water supply for, or in, the Sacramento River watershed. The study should be coordinated with the CALFED program and take advantage of information already developed within that program to investigate water supply increase alternatives. Where alternatives evaluated are in addition to or different from the existing CALFED alternatives, such information should be clearly identified.

Environmental review also will be an important part of the SRWRS feasibility study, as directed in the Reclamation Manual, Directives and Standards CMP 05-02, which stipulates that feasibility studies should:

- Include additional data collection and analyses to develop and consider a full and reasonable range of alternatives.

- Include such items as identification of present and future conditions, identification of problems and needs, evaluation of resource capabilities, formulation of alternative plans, analysis and comparison of alternatives, and plan selection.

- Be normally integrated with compliance under NEPA, the Fish and Wildlife Coordination Act, ESA, National Historical Preservation Act, and other related environmental and cultural resource laws. These activities should proceed concurrently with a feasibility study and culminate in an integrated PR and NEPA compliance document. Feasibility studies also should comply with State (in this case, CEQA), tribal, and local environmental and cultural resource laws and ordinances, as appropriate.

Through this environmental review, potential impacts of the alternatives will be identified, and mitigation for the significant environmental effects of the recommended project will be proposed and documented in the EIS/EIR.

It is envisioned that, depending on the outcome of model simulations and other aspects of impact analysis, the language in Subsection (c) may call for additional considerations by Reclamation beyond the requirements of NEPA or CEQA to increase water supply for CVP contractors and other water users in the Sacramento Valley. These considerations will be included in the draft and final PR, prepared in conjunction with the EIS/EIR, with identified options to reduce to insignificance any significant water supply impact on water users in the Sacramento River watershed, and/or increase water supply for the Sacramento River watershed. These options would be derived from ongoing programs and studies such as the CALFED Program and projects for Phase 1 Implementation of the CALFED ROD, and SVWMP. The final decision(s) of Reclamation will incorporate these additional considerations.

STUDY SCHEDULE

The four phases of SRWRS development are roughly divided into two study phases for administrative purposes. Phase 1 covers the Initial Investigation Phase and Initial Plans Phase, focusing on alternative development, preliminary screening, and public involvement and outreach strategies. Phase 2 covers the

Alternative Plan Phase and Recommended Plan Phase, emphasizing preparation of the feasibility report and environmental documentation. A tentative study schedule is shown in **Figure 8-1**. SRWRS completion is currently expected to span more than 3 years with a tentative completion date in 2006. The schedule is subject to revision to reflect progress in study development and agency consultation.

Depending on the final determination of necessary Federal involvement in project implementation, Reclamation would consider submitting the **Final PR/EIS/EIR** to Congress, as directed by the study authorization.

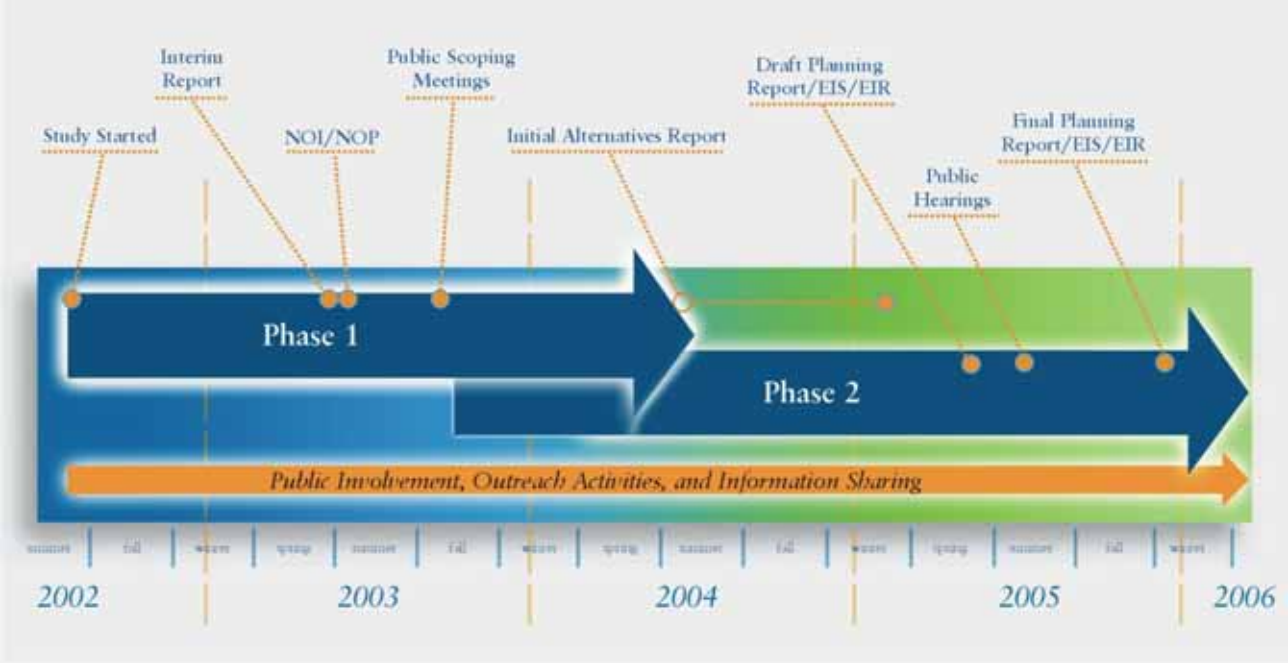


Figure 8-1. Tentative Schedule for SRWRS Development

CHAPTER 9. LIST OF PREPARERS

The **Initial Alternatives Report** and its appendices were prepared by the following individuals.

Name	Affiliation	Major Areas of Contribution
SRWRS Partners		
Mona Jefferies-Soniea	Reclamation	Project manager, Reclamation
Rick Johnson	Reclamation	Study management team, Reclamation
Sammie Cervantes	Reclamation	Public relations
Einar Maisch	PCWA	Study management team, PCWA
Steve Yaeger	PCWA	Project manager, PCWA
Janet Goldsmith	PCWA	Legal counsel for water rights, PCWA
James Moose	PCWA	Legal counsel for environmental review process, PCWA
Gary Reents	Sacramento	Study management team, Sacramento
Dan Sherry	Sacramento	Project manager, Sacramento
Mel Johnson	Sacramento	Project review
Martha Lennihan	Sacramento	Legal counsel, Sacramento
Joe Robinson	Sacramento	Legal counsel, Sacramento
Derrick Whitehead	Roseville	Study management team, Roseville
Ed Kriz	Roseville	Project manager, Roseville
Robert Roscoe	SSWD	Study management team, SSWD
Paul Bartkiewicz	SSWD	Legal counsel, SSWD
Warren Jung	SSWD	Project manager, PCWA
John Valdes	SSWD	Project review
Consultant Team		
Yung-Hsin Sun	MWH	Project manager, planning lead
Vanessa Nishikawa	MWH	Planning
Andy Draper	MWH	Hydrologic modeling lead
Ming-Yen Tu	MWH	Hydrologic modeling, CALSIM II and DSM2
Jafar Faghih	MWH	Hydrologic modeling, IGSM
Ping Chen	MWH	Hydrologic modeling, IGSM
Phil Salzman	MWH	Engineering design lead, intake
Bonny Starr	MWH	Engineering design, WTP
Glen Grant	MWH	Engineering design, pipeline
M. Alejandro Salazar	MWH	Engineering design
Susan Burke	MWH	Economics
Irina Torrey	MWH	Environmental review lead
David Stevens	MWH	Environmental review, terrestrial
Cindy Jones	MWH	Environmental review, terrestrial

Name	Affiliation	Major Areas of Contribution
Emily McAlister	MWH	Technical editor
Maria Pascoal	MWH	Graphic designer
Kathy Bess	MWH	Word processing
Walter Yep	Walter Yep, Inc.	Quality assurance/quality control
Teresa Pacheco	Walter Yep, Inc.	Quality assurance/quality control
Paul Bratovich	SWRI	Environmental review, fishery
Dianne Simodynes	SWRI	Environmental review, fishery
Christi Black	Ogilvy Public Relations	Public relations lead
Kierstan DeLong	Ogilvy Public Relations	Public relations
Lisa Page	Ogilvy Public Relations	Public relations